



WESTERN INDUSTRY

• The world's mightiest crane in action. Its 182-foot high runway towers above the Naval ships it services. Details on page 5.

IN THIS ISSUE: Plugging the Holes in Industry-Wide Bargaining; How Workers Are Protected in a Nuclear Energy Plant; Job Evaluation: What It Takes to Make It Pay; How Many Dollars Can a Lift Truck Save? What's Ahead For Diesels; Production Techniques

Forty-Five Cents

VOLUME XIII

NUMBER 2

February, 1948

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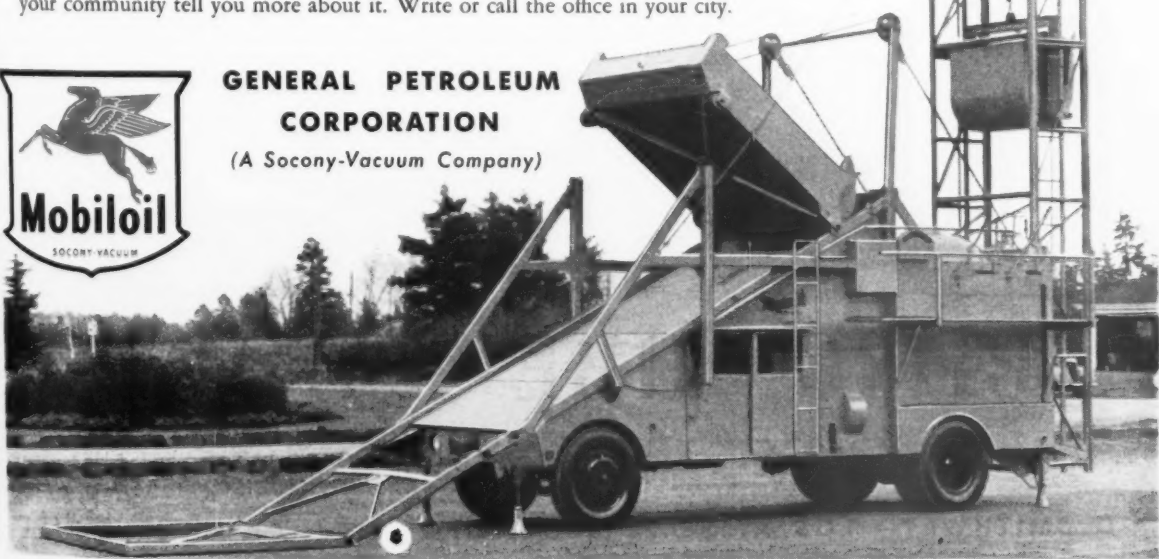
"When we ship a piece of equipment we advise the Mobil people so they can follow through with the receiver to assure continued use of the proper lubricants."

There are many advantages available to you, too, in the General Petroleum industrial lubrication program. Why not let our specially trained representative in your community tell you more about it. Write or call the office in your city.



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Editor

A. C. PRENDERGAST

Associate Editors

D. F. Stevens
Arnold Kruckman

Editorial Assistants

B. P. Arnold
M. S. Dean



Correspondents

Sterling Gleason
946 Lucile Avenue
Los Angeles 26, Calif.
Henry W. Hough
1151 Humboldt Street
Denver 6, Colo.
O. N. Malmquist
c/o Salt Lake Tribune
Salt Lake City 1, Utah

Northwest Office

D. F. Stevens
2611 Franklin Avenue
Seattle 2, Wash.
Minor 0910

Washington Office

Arnold Kruckman
1120 Vermont Avenue, N.W.
Washington 5, D.C.
Telephone District 8822



Advertising Offices

CHICAGO OFFICE

A. C. Petersen, District Manager
5835 S. Spaulding Ave., Chicago 29
Telephone PROspect 1685

SAN FRANCISCO OFFICE

R. C. Williams, District Manager
503 Market St., San Francisco 5, Calif.
Telephone YUkon 6-1537

LOS ANGELES OFFICE

Clarence G. Beardslee, District Manager
3835 Wilshire Blvd., Los Angeles 5
Telephone FITzroy 9462

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Arthur F. King . . . President
Donald F. Forster . Exec. V.-Pres.
L. P. Vrejtis . . . Treasurer
L. B. King . . . Secretary
Ralph P. Dillon . Circulation Mgr.
V. C. Dowdle . Production Dept.

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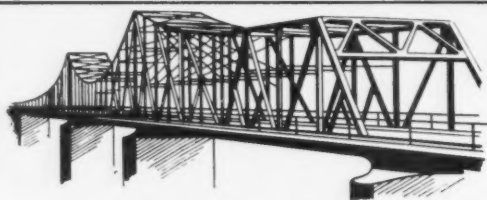
Front Cover

Largest and most powerful hoisting machinery in existence, this \$2,500,000 bridge-type crane will provide high-speed repair services at San Francisco Naval Shipyard for major Navy ships of the Pacific fleets. It can lift 630 tons (half again the capacity of facilities in New York harbor); normal capacity 500 tons.

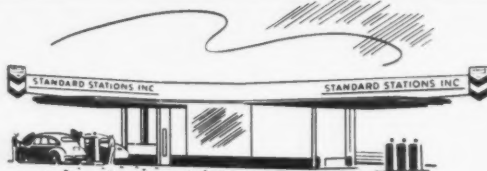


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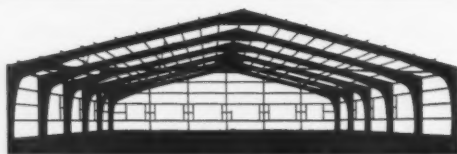
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World's most powerful atom-smasher, the mighty cyclotron, is shown here while under construction before the war. Horizontal members of the giant electro-magnet are formed with 88 U.S.S. steel plates, 2" thick, 52' long. Each plate weighs about 14 tons. For size comparison, note the man standing to the right of the lower pole face of the magnet.

3,700 tons of tough, versatile steel used in cyclotron!

The cyclotron is a dramatic illustration of how steel can pass the stiffest tests. While such examples are rare, steel is being put to profitable use in countless construction jobs, large and small, throughout the West.

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Extra toughness and shock resistance—Incombustibility—High strength-weight-ratio—Highest modulus of elasticity—Versatility of application—Great durability—Ultimate economy

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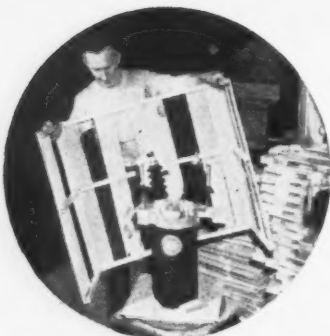
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Kyle Corp. automatic oil circuit recloser is set on a specially designed Wirebound crate base. The crate holds the recloser snugly and absorbs all impacts.



In just three minutes the wrap-around sides are secured and the 65 pound recloser is ready for shipment. Sturdy Wirebounds cut shipping damage to almost nothing.



Larger, 275 pound reclosers are also crated in Wirebounds. Prefabrication of special interior packing assures a perfect fit and gives greater shipping protection.

this 3-minute

WIREBOUND

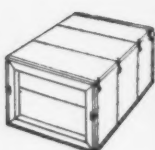
**gives KYLE CORP.
greater protection and
lower freight costs!**

Automatic oil circuit reclosers manufactured by the Kyle Corporation of South Milwaukee, Wisconsin, are built to withstand rugged use, but the company experienced shipping damage when reclosers were packed in boxes because porcelain bushings often broke under rough handling and oil leaks developed as the result of inadvertant "upside-down" loading.

Wirebound Crates have solved these shipping problems. Wirebounds are tailor-made for the Kyle reclosers in such a way that jolts and shocks are absorbed by the container itself. And when freight handlers actually see the recloser inside the crate, upright handling and loading naturally follows.

Moreover, Wirebound's time-tested combination of steel wire and thinner wood reduce shipping costs, bring important shipping room economies in low initial cost and speed of assembly. Just three minutes elapse from the time a recloser is placed on the crate base until the completed unit is ready for shipment—in safety! Shipping room space is conserved, too, because Wirebound wrap-around sides, bases and tops are stacked flat.

Today, all Kyle reclosers are shipped in Wirebounds and damage claims are negligible! To learn more about the benefits you, too, may receive by switching to Wirebounds, fill out and mail the coupon below.



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BOXES & CRATES

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67147



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PLANING 50,000 WELDS *WITH ONE SET OF KNIVES*



Bethlehem Special High Speed (BSHS) Tool Steel Cutting Knives on hydraulic stripping machine used for smoothing welds on oil drums.

A single stroke of a hydraulic stripping machine removes the weld-ridges from both the inside and outside of these resistance-welded oil drums. The work is done by three pairs of knives arranged in tandem. The first pair chips off the hard oxidized surface of the weld, the second makes the hogging cut while the third makes the finished cut. One quick operation leaves the weld smooth and flush with the adjacent surface.

At present Rheem Manufacturing Company, of South Gate, Calif., can finish 50,000 drums in 25 days with one set of stripping knives. These knives are made of Bethlehem Special High Speed (BSHS) Tool Steel and require sharpening only once a day. Formerly with a different grade of tool steel Rheem found it necessary to use from three to six sets of knives during a single day's production of 2000 drums.

BSHS (18-4-1) is a general-purpose tool steel well known for its maximum red hardness, its resistance to abrasion and resistance to shock. It is used to advantage in all of the usual types of rough-cutting machine tools, in a wide variety of special cutting tools and in special dies for both hot and cold work.

Ask your distributor about BSHS when you need a general-purpose tool steel for rapid cutting jobs.

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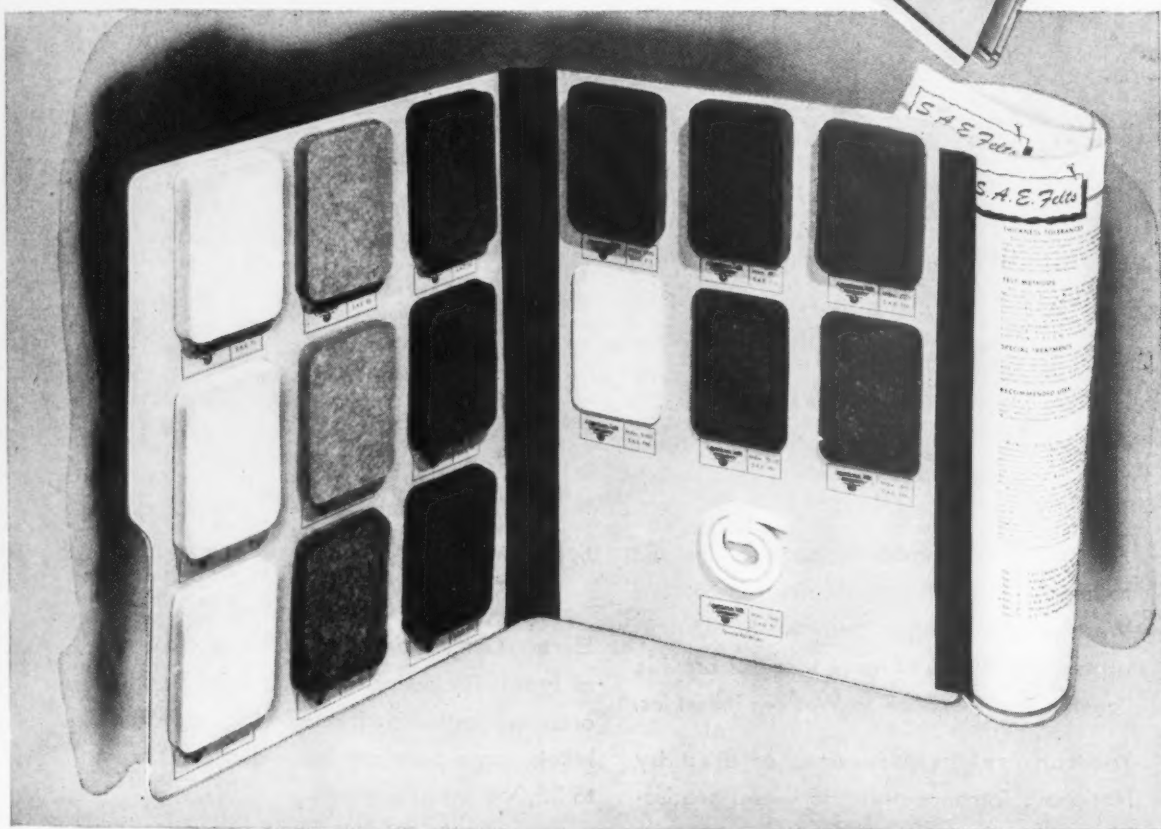
Sales Offices: San Francisco, Los Angeles, Portland, Seattle, Honolulu

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General Chemical's Sales and Technical Service organizations work shoulder to shoulder with Industry . . . constantly alert to changing chemical demands in every field. Closely coordinated with them are General's progressive research program, and extensive—yet extremely adaptable—production facilities.

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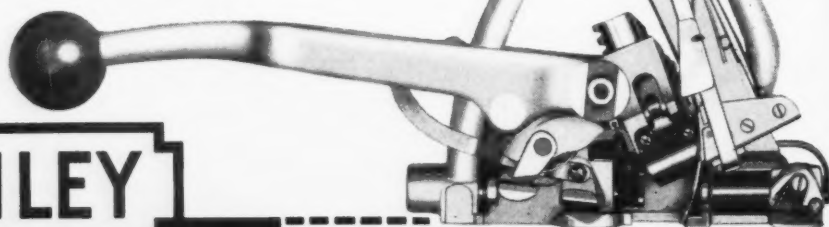
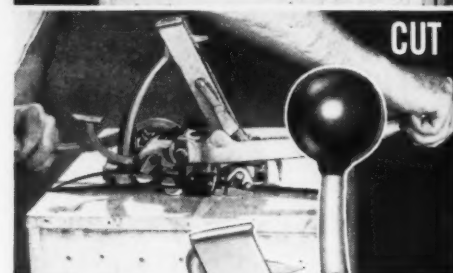
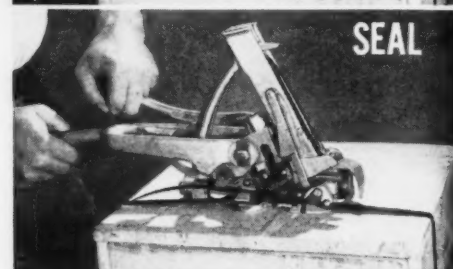
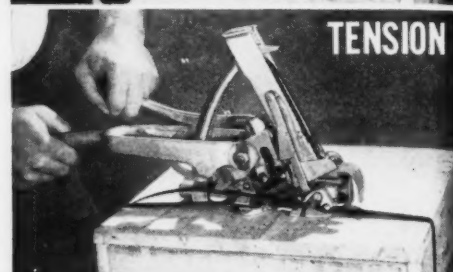
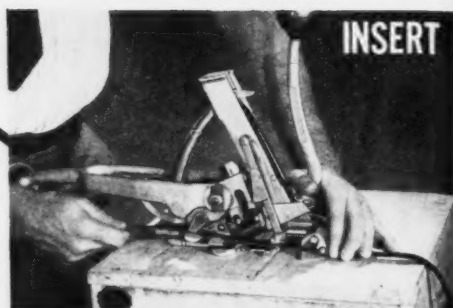
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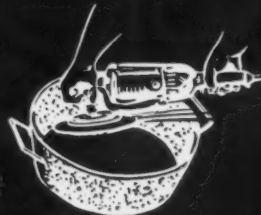
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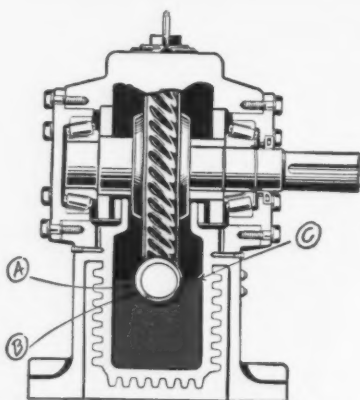
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Slight button pressure moves tons, making the operator equivalent of many men of muscle. Large aisles no longer necessary, goods pass safely overhead; up in the space that formerly was waste, the area above men and machines.

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CASE 1043-MINIMIZING LEAKAGE IN LARGE ENCLOSED GEAR SETS.



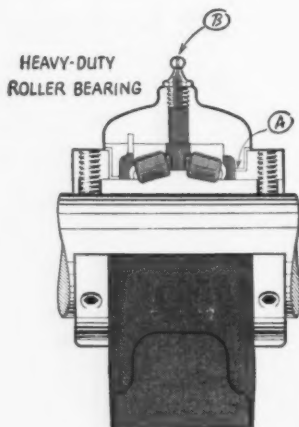
AIR-COOLED WORM GEAR SPEED REDUCER

In heavy-duty industrial enclosed reduction gears the relatively high viscosity characteristics of Calol Gear Compound cut consumption. Efficient in both conventional and worm types and where such gears carry extra loads or are worn. Comes in eight grades: 60, 100, 120, 135, 150, 190, 225 and 410.

- A. Oiliness and extreme pressure additives cushion shocks, prevent vibration, welding and extra wear.
- B. Non-corrosive - will not harm bearing or gear metals.
- C. Contains effective foam inhibitor - breaks bubbles that form and stops building up of pressure in case.

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Has sodium-aluminum soap base - feeds evenly through bearings ... oil stock selected for high heat-resistant qualities.

- A. Minimizes seepage through housings and seals.
- B. Resists cold temperatures - pumpability remains good in all weather.

Calol S.A. Grease has proved excellent for low-, medium-, and high-speed anti-friction bearings. It is packed in 35-, 108- and 420-pound containers.

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FOR EVERY NEED A **STANDARD OF CALIFORNIA** JOB-PROVED PRODUCT



In Our Mail Box

Small Fires Still Spreading

Editor, *Western Industry*:

Your editorial entitled, "Small Fires Can Spread," is interesting. As you suggest, the misinformation supposedly well informed people can acquire is amazing. The alleged "plot" against labor unions is, as you have said, absurd and silly.

The annual Industrial Relations Conference at Palm Springs, as you know, has been sponsored exclusively by the Merchants and Manufacturers Association. Except for the first conference four years ago, the NAM has had no part in it, although individuals from that organization have, from time to time, been invited to participate as conference leaders.

Our Public Relations Department has been hoping to have some representative from organized labor attend and participate. While some union representatives have indicated interest, they have left the impression that they would be afraid to come because of possible repercussions from other unionists.

The press has always been well represented at these conferences; this year, all four of the Los Angeles metropolitan dailies sent men who spent the entire four days with us and reported the sessions fully.

Not only has management nothing to hide in these conferences, but we would welcome any method of getting over to rank and file union members, as well as all other employees, the planning and thinking which is being done in a sincere effort to achieve "better employment relations." In fact, we are publishing a weekly paper for employees, the *Southern California Forum*, which we hope will help accomplish that end.

GEORGE SHELLENBERGER
Executive Vice-President
Merchants & Manufacturers Ass'n
Los Angeles, California.

Editor, *Western Industry*:

We have read the editorial comment in your December issue with interest and some amusement.

As you say, it is difficult to believe that responsible and intelligent people who are genuinely concerned with the labor-management problems can so easily accept, as truth, some of the highly colored and distorted propaganda regarding the L.M.R.A.

The law is complicated and needs a great deal of understanding. It is our belief that employers have the responsibility of making every effort to explain the law and its provisions to employees and communities in which their plants are located.

We are convinced that as employees and the public learn more about the law, and the rights and protection it provides for employees and the public alike, its acceptance will become general. In fact, there is encouraging evidence of that fact already.

Your suggestion that the NAM and M&M invite some labor representatives to attend our respective Institutes on Industrial Relations is an extremely interesting one. It is an idea that has had considerable discussion here. Although it is a departure from past practices it appeals to us greatly as an effective way of giving labor a first-hand look at the whole hearted sincerity with which management is striving toward the improvement of employer-employee relations through more advanced and constructive policies and practices.

(Continued on page 21)

EDITORIAL COMMENT

A New Taylor Out of the West?

CAN the West with its freedom of thinking produce the new Taylor, who, according to Peter F. Drucker, is needed to finish the job the first Taylor began 60 years ago? Speaking before the American Management Association in December, Mr. Drucker asserted that where the first Taylor broke down the job and gave us the tools of analysis, the new Taylor will have to synthesize the job again in such a way as to make the fullest possible use of the human factor in mass production.

The general trend so far, he said, has been in the direction of re-making man in the image of the high-speed, single-purpose machine tool, which ignores the fact that man is infinitely better designed and infinitely more efficient in his operations than any machine or engine we have ever been able to build. But his efficiency, in Mr. Drucker's opinion, is his ability to do a great many things, i.e., his ability to coordinate. The attempt to use man as a single-purpose machine tool is, therefore, bound to be inefficient in two ways: by setting up resistances and fatigues which lower the actual efficiency, and by leaving unused a large part of the available resources and effectiveness.

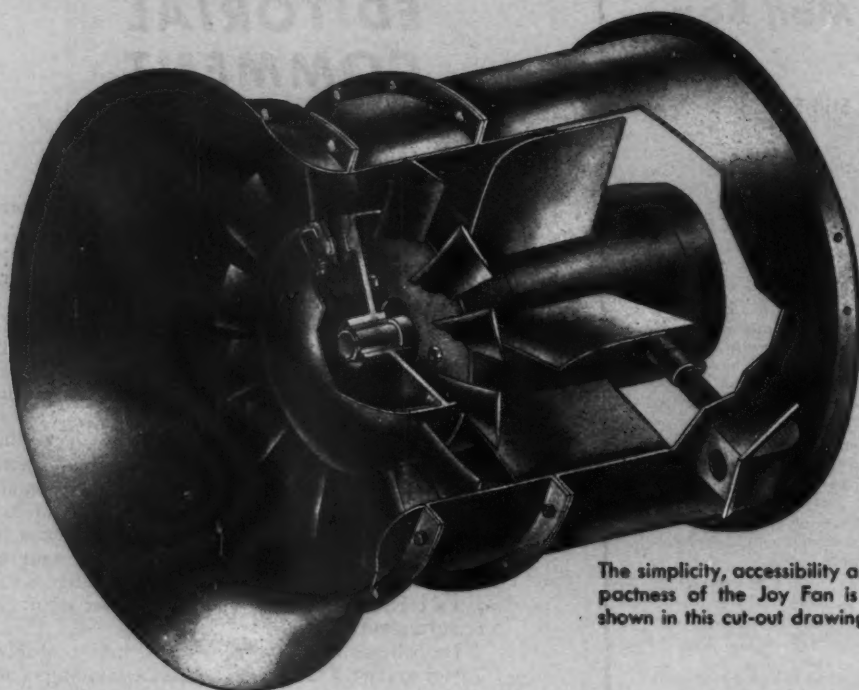
He believes there are many signs that—probably without any Taylor to crystallize a theoretical understanding of the problem—we are beginning to move in a direction which may lead to a radical break with the trend of the last 25 or 30 years. Dr. Drucker says it is not impossible to replace the "production line in space" of our traditional practices by a "production line in concept" which analyzes, breaks down and lays out the job as a series of elementary motions, but integrates a number of such motions into one actual job. Will the West, where so many radical and effective things were done in wartime, produce the new Taylor?

Let Industry Speak Up

FOR the ancient conundrum, "How many wells make a river?," let us substitute "How many Colorado Rivers make enough water for seven states?" All the king's horses and all the king's men haven't been strong enough or wise enough in years gone by to figure out how the water should be divided up to suit everybody, and now the problem is coming up again.

Utah interests are proposing a Colorado River basin commission, composed of the governors of the seven interested states and the secretaries of interior and agriculture to do top-level overall planning. But, as the "Wasatch Front" regional review in our December issue points out, "the most obvious question is whether the seven states would find it any easier to agree through the medium of the proposed commission than through the compact commissions which have heretofore been set up. Certainly, to make the setup effective the individual states would have to forego the power of veto, and in the skirmishes to date, most of the states have been somewhat more disposed to trust the federal government than each other."

But today we have a West that is beginning to be conscious of itself as an entity, beginning to perceive that it is an economic unit, beginning to search for ways and means of working in unison. To that consciousness industry has contributed a notable part, and industry should come forward now to bring its thinking to bear on the Colorado River situation, just as it did in the case of the postwar Western steel problem. The Colorado water and power problem can be solved satisfactorily if we realize that the West as a whole is greater than any of its parts. A general Western meeting to present all of the considerations involved would be desirable, so that the West could see the problem in its entirety and then move toward a logical conclusion. The big question is how to organize such a conference on an impartial basis.



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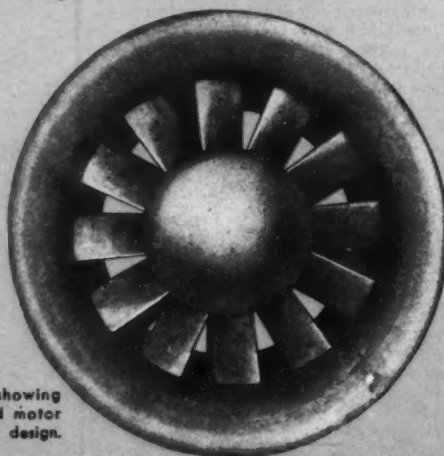
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MAIL BOX— (Continued from page 19)

Unfortunately there are a number of problems connected with such an invitation. Speaking for the NAM, our Institutes are designed for the express purpose of giving our members the opportunity of some frank, hard hitting discussion and self appraisal. As you probably know, these Institutes are operated on the basis of small and intimate round-table conferences with each participant getting into the thick of discussion. It is easy to see that many management principals would have some hesitancy in expressing themselves frankly if representatives of organized labor were present.

It may interest you to know that in the last two Institutes held by the NAM, we invited representatives of the United States Department of Labor, the former Conciliation Service, universities which teach Industrial Relations courses, and the Industrial College of the Armed Forces. This experiment worked very well because it gave these people their first real opportunity to gain a better understanding of management's growing determination to cultivate employee good will and develop better relations.

We agree wholeheartedly with your concluding sentence, "management has nothing to hide." To go one step further, management's good intentions and sound practice too frequently remain hidden because management fails to tell its story to its employees and to the public.

SYBYL S. PATTERSON
Assistant Director
Industrial Relations Department
National Association of Manufacturers

Editor, Western Industry:

Your editorial comment in the December issue of *Western Industry* is indeed provocative. Needless to say, that when supposedly intelligent labor leadership publicly issues such statements, it only serves to indicate the wishful thinking of a frustrated mind.

Since the Taft-Hartley Bill tends to weaken the position that certain unfit labor leaders have enjoyed for many years, it is only natural for these individuals to "wail" the loudest.

We all know and understand that the Taft-Hartley Bill may not be the perfect instrument, but until such time as the necessary changes can be made, it would be well to point out these individuals whose selfish interests are best served by the dissemination of dastardly lies and undermining statements.

PETER L. MARCUS
Personnel Director
Southwest Steel Rolling Mills
Los Angeles 2, Calif.

Appreciated

Editor, Western Industry:

We wish to express our appreciation for the very fine summary of our current activity which appeared on pages 70 and 71 of the November issue of *Western Industry* (Vol. 12, No. 11).

The Raw Materials Survey has undertaken a very difficult and many-sided problem. Recognition from periodicals of the caliber of *Western Industry* gives us considerable encouragement and sincere pleasure.

RICHARD J. ANDERSON
Managing Engineer
Raw Materials Survey
Portland 5, Oregon.

Editor, Western Industry:

Before closing the records for the old year, the writer wants to thank you for the interest and fine spirit of cooperation given our company and this office in the promotion of our buying program. Our progress has been most satisfactory.

(Continued on page 23)

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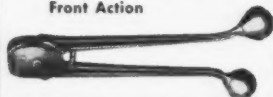
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MAIL BOX— (Continued from page 21)

We are sure that what is good for Ford is going to be good for the West Coast; therefore, we will continue to work for the industrialization of the West, which should mean many new jobs and increased purchasing power.

L. C. DISSER

West Coast Purchasing Representative
Ford Motor Company

Divorce Outdated

Editor, *Western Industry*:

We appreciate your interest in our 10-year plan at American Electric Motors, Inc. Your article in the October issue was very explicit and done with the same sincerity that the plan was presented to the employees.

The article on the current salesmen's problems as outlined by Mr. Heyneman is an excellent portrayal of a specific case of the general labor relations problems that confront all management today.

Besides American Electric Motors, we are interested in Mr. Heyneman's article from Zonne Electrical Tool Company, a sales organization of 40 employees. Both the sales manager at American and Zonne's will be interested in reading your sales article.

The era of divorced management and labor (or Mr. Heyneman's special case of salesmen) is an outdated cleavage. At both of our enterprises we are attempting to educate all of the salesmen, foremen and employees to actually take a greater part in the future policies of the businesses. This, I am sure, will fall in line with the advancements recommended by Mr. Heyneman.

P. W. ZONNE

American Electric Motors, Inc.
Los Angeles, California

For Competitive Prices

Editor, *Western Industry*:

I was very much interested in your article, "Western Merchandisers Want More Western Manufactured Goods." It was very much to the point and should serve in trying to bring to the attention of Western manufacturers the need for more and better production facilities in the West so that our prices can be competitive with those of manufacturers in other regions of the United States.

The biggest problem confronting the Trade Development Committee is the method of getting to Western manufacturers the items that should and could be manufactured in the West for the Western market. It has been suggested that various trade publications carry a column or page setting forth a list of wanted products and the potential purchasers.

There should be a number of sources for this information and if you are interested, I am sure that the Trade Development Committee of the California Manufacturers Association could make such information available.

H. K. POHLMAN, President

Arrowhead Rubber Company

Redwood City, Calif.-Van Wert, Ohio.

Cover to Cover

Editor, *Western Industry*:

Last night at home I read *Western Industry* from cover to cover, and I have always enjoyed the information given in this publication. I was particularly impressed by the message that Mr. Ken Norris had sent to you warning Western automobile suppliers of the financial difficulties in the auto industry. The article you wrote regarding the Trade Development Committee of the California Manufacturers Association was very good. I think it carries a good message. I also think it was very well written.

J. W. SHEEHAN, President

Arcturus Manufacturing Corp.
Venice, California.

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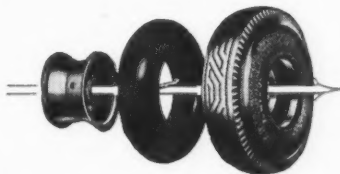
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UNITED STATES STEEL

THE WESTERN OUTLOOK..News...Statistics...

1

Regardless of possible government controls, employment and business picture rosy for 1948, say analysts; Pacific Northwest booming with carloading and construction breaking all records; California's tomato pack highest ever; lack of women workers cramps style of Western garment manufacturers; Kaiser opens pipe mill at Fontana.

Employment Picture

ACCORDING to analysts, economists, and those who profess to be "in the know," the employment picture for 1948 is rosy. Even with seasonal fluctuations, the Western states have held their own consistently, and the low level of unemployment will continue throughout this year.

Labor Market Analyst A. J. Miller of the San Francisco regional office, United States Employment Service, recently returned from a trip to Washington, D. C. . . The employment picture, he declared, is good and market analysts and statistical experts for the Western States feel that even if Congress places controls on materials, the tremendous demand will forestall any unemployment that might result from curtailed manufacturing. Government control could effect employment levels at any point, but on the other hand the Marshall Plan will increase demand so much that any drop could be easily counteracted, said Mr. Miller. It is not anticipated, however, that Congress will place any controls on materials at all, he said.

California manufacturing employment reached a new postwar peak level in November. Including canning, which is subject to marked seasonal fluctuations, however, employment dropped to 716,900 from 736,200 in October, but remained above the November levels of the last two years.

Wage- and salary-worker employment in the non-durable goods division was at the highest November level on record as all major sub-groups in the division, with the exception of the food and petroleum industries, reported the same or higher employment in November than in October. Employment in apparel and printing and publishing continued the rise of the past several months to reach new highs in November, and chemicals remained at the record peak set in October. The number of wage and salary workers in non-durable goods industries as a whole totaled 328,400 in November compared with 350,500 in October and the year-ago level of 316,400.

In the durable goods division, employment increased to 388,500 in November, the highest level since May. Gains between October and November in shipbuilding, electrical machinery, furniture, non-ferrous metals, and aircraft more than offset seasonal losses in lumber and timber and small declines in machinery, stone, clay and glass, and iron and steel. In all durable goods combined, the current employment level compares with 385,700 in the preceding month and 389,100 in November of last year.

These figures and information were obtained from the California Labor Statistics Bulletin, published by the California State Department of Industrial Relations, Division of Labor Statistics and Research, with M. I. Gershenson, chief of division.

Total employment in the state of Washington is estimated at 685,100 for October as compared to 670,600 in October, 1946, and 641,700 in October, 1945. The two-year period witnessed a marked expansion in the aircraft, lumber, pulp and paper, construction, and trade and service industries.

Record peace time employment extended into the closing weeks of 1947 in Oregon despite slightly heavier than usual seasonal increases in the number of idle workers throughout the state. Although comparatively few skilled male workers were jobless, further declines in job openings, particularly for the unskilled, foretold continued seasonal rises in unemployment after the holidays, probably into February.

With a level of employment at least 20 per cent higher than during Oregon's first postwar winter, gradual improvement in the state's economic picture during the past two years was reflected in the gradual decrease in unemployment, particularly in the metropolitan area.

Oregon's increasing population, attracted by steadily expanding industries, promises to hold the state's covered employment over the 300,000 mark with an active labor force of more than 600,000. Prospects of winter time employment establishing a level nearly double prewar figures and only slightly under the 310,092 of February, 1944, were predicted by employers.

MANUFACTURING EMPLOYMENT

Estimated Number of Employees in Non-Agricultural Establishments—Source: U. S. Bureau of Labor Statistics

	MONTANA		IDAHO		WYOMING		COLORADO		NEW MEXICO		ARIZONA		UTAH		NEVADA		TOTAL MTN.	
	1946	1947	1946	1947	1946	1947	1946	1947	1946	1947	1946	1947	1946	1947	1946	1947	1946	1947
June	15,700	17,800									11,100	13,200		25,020				
July											12,000	12,700		29,810	3,200	4,000		
August											12,500	12,700		29,620	3,400	4,000		
September	16,900	18,100									12,500	12,700		30,820	3,400	3,700		
October	18,000	19,100									12,700	12,600		30,170	3,400	3,700		
November														31,550	3,500	3,700		

	WASHINGTON		OREGON		CALIFORNIA		TOTAL PACIFIC	
	1946	1947	1946	1947	1946	1947	1946	1947
June	170,200	170,800	125,005	133,571	665,200	688,200	960,405	992,571
July	176,900	176,500	121,000		700,700	703,800		
August	177,300	185,000			740,900	758,900		
September	179,400	191,700	135,846	143,450	738,800	743,600	1,048,646	1,078,750
October	175,400	183,900			725,700	734,300		
November	168,800	178,400			705,500	716,900		

INSURED UNEMPLOYMENT

(Under all programs: figures in thousands. From Social Security Board)

	Ariz.	Colo.	Idaho	Mont.	Nev.	N. Mex.	Utah	Wyo.	Total Mtn.	Calif.	Ore.	Wash.	Total Pacific
Week ending													
June 6	5.2	5.4	2.1	2.1	1.6	3.7	2.7	.6	23.4	226.0	11.5	25.7	263.2
July 5	4.9	5.0	1.4	1.8	1.6	3.3	3.4	.4	21.8	217.9	15.5	23.4	256.6
August 2	6.6	5.3	1.7	1.5	1.6	3.0	3.7	.5	23.9	206.2	13.6	26.4	246.2
Sept. 6	5.7	4.1	1.2	1.4	1.4	2.1	3.4	.3	19.6	164.4	10.9	24.5	199.8
Oct. 4	4.3	2.5	.7	1.1	1.3	1.7	2.3	.2	14.1	138.3	8.4	21.3	169.0
Nov. 8	4.1	2.5	1.3	1.4	1.5	2.0	3.6	.3	16.7	134.1	14.7	24.6	173.4

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| • Wood Working Benches | • Hanging Cabinets | • Folding Chairs | • Work Benches | • Bar Racks | • Hopper Bins | • Desks |
| • Economy Locker Racks | • Welding Benches | • Drawing Tables | • Drawer Units | • Bin Units | • Parts Cases | • Stools |
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THE WESTERN OUTLOOK...News...Statistics...

2

Employment rose slightly in Montana in November, due to a substantial increase in metal mining, despite a continued seasonal decline in construction activities.

Sugar refining, which started in October, resulted in increased employment at Sidney, Chinook, Hardin, Billings, and Missoula.

Arizona employment increased slightly between mid-October and mid-November. Total employment in manufacturing increased 3.2 per cent from October to November, with all industries in this group participating in the increase. Manufacturing employment, however, decreased 3.7 per cent under last year's figure, non-ferrous metals and their products leading with a sharp decrease of 37 per cent, or a loss of 1,000 workers over 1946. The decrease was offset to a great degree by an 18 per cent increase in lumber and timber basic products, resulting in an estimated employment of 2,600 in the industry for November.

November's severe weather had a marked effect on Utah's labor market. It slowed work in construction, food processing and speeded the buying of soft goods, especially woollens. Metal mining and coal

mining increased their labor force. January figures should see comparatively sharp losses. In the Salt Lake district there is still a labor shortage of skilled workers.

Commerce and Banking

First quarter 1948 carloading estimates for Pacific Coast Transportation Advisory Board territory are 11.9 per cent above 1947 total, or 49,503 carloads. Among the expected percentage gains are: citrus fruits, 16.2; deciduous fruits, 143.9; frozen fruits and vegetables, 16.1; agricultural implements and vehicles, 80.3; cement, 42; cotton, 61.9; cotton seed, soybean-vegetable products, 53.1; iron and steel, 17.2; lumber and forest products, 17.2; sugar, syrup and molasses, 99. Aircraft is the big item on the downside, off 49.8 per cent.

Carloadings in Pacific Northwest Advisory Board territory for the first 11 months of 1947 made an all-time record by slightly topping 1944. Due to a larger movement of lumber and forest products than at any time since 1942, a record movement of fruit and a rebound almost to 1945 levels in miscellaneous items, quite likely accounted for by the resumption of the wartime aluminum ingot scale of production.

Department store sales for the Christmas season through the second week in December in the 12th Federal Reserve District, while 6 per cent ahead of 1946 in dollar volume, was below the national increase of 9 per cent. The range was 15 per cent gain in Portland, closely followed by San Diego, Salt Lake City and Spokane down to no gain in Los Angeles.

Power and Fuels

The West squeezed by the December electricity peak somehow, with only 4 per cent reserve where there should have been 8 per cent. Apparently the escape was due to the fact that the peak came earlier than expected—about Dec. 15 instead of Dec. 24—and to lack of bad weather which could have brought down poles.

A new instantaneous peak demand was recorded in the western division of the Pacific Northwest Power Pool Dec. 11 when 99 per cent of generating capacity was in use. "Load moulding" was utilized in the Pacific Northwest by urging large industrial users to stay off the 4 to 6 p.m. daily peak as far as possible and municipalities to pump water at other hours.

Last fall's 50-cent-a-barrel increase in the price paid in the Midwest for crude oil has spread to the West Coast, where major companies have followed suit and have also raised gasoline and fuel oil prices to reflect this added cost.

Several moves to iron out transportation bottlenecks, a major factor in the spot shortages throughout the nation: (1) fifty Maritime Commission tank ships now laid up are being refitted for the Navy, which thereupon will return the borrowed ships it is now using to the Maritime Commission for transportation of commercial oil cargoes along the East Coast; (2) demurrage rates on tank cars have been substantially increased by ODT in an effort to speed up the turn-around time of oil cars; and (3) the American Petroleum Institute's public relations committee is sponsoring a publicity campaign to encourage voluntary fuel oil conservation in shortage areas.

The present tight situation emphasizes the immediate need for a synthetic fuels industry in the U. S., instead of postponing it "until an emergency period," a Bureau of Mines official said recently. Such a program, requiring several years to build a capacity of one to two million barrels daily, would be five to ten times the magnitude of the war-time synthetic rubber undertaking. Fuel costs would be three to five

WHOLESALESALES

In thousands of dollars. Percentage changes are from corresponding month of preceding year. From Bureau of the Census.

MOUNTAIN

	Automotive Supplies	Change	Electrical Goods	Change	Furn. and house furn.	Change	Groc. and foods exc. farm prod.	Change	General Hardware	Change
May	681	+10	3,007	+140	...	...	3,559	-6	1,718	+35
June	700	+16	3,031	+159	...	...	4,097	+16	1,615	+31
July	727	+14	2,915	+95	...	...	3,783	+21	1,775	+29
August	631	+7	3,653	+52	...	...	3,880	+10	1,816	+10
Sept.	396	-7	3,552	+75	...	...	4,337	+16	1,695	+7
Oct.	828	+5	2,121	+1	397	-18	5,227	+9	2,350	+33

PACIFIC

	Automotive Supplies	Change	Electrical Goods	Change	Furn. and house furn.	Change	Groc. and foods exc. farm prod.	Change	General Hardware	Change
May	2,930	+9	12,158	+109	2,640	+59	10,425	-3	6,114	+23
June	2,580	+5	11,055	+108	1,221	+127	12,036	+7	7,097	+6
July	2,932	+4	10,528	+63	1,617	+7	11,890	+19	5,523	+16
Aug.	1,266	+1	12,078	+34	1,536	+21	7,780	+10	6,201	+22
Sept.	3,211	-4	14,718	+40	3,545	+37	13,729	+19	5,475	+11
Oct.	3,245	-11	18,232	+39	2,126	-1	11,574	+6	8,915	+5

INDUSTRIAL SUPPLIES

	Change	Lumber & bldg. mat.	Change	Mch., equip. and supplies excl. elec.	Change	Metals	Change
May	-2	1,223	+6	729	+27	...	...
June	-12	1,206	+45	828	+7	600	+1
July	-8	1,099	+26	704	-8	739	+4
Aug.	-25	1,341	+34	664	+9	696	-1
Sept.	-9	1,587	+63	431	+9	799	-4
Oct.	+3	1,696	+55	791	-10	818	+5

INDEX OF DEPARTMENT STORE SALES

Index numbers, 1935-39 daily average=100 with seasonal adjustment. Compiled by Federal Reserve Bank.

	Total 12th Fed. Res. Dist.		Southern California		Northern California		Portland		Western Washington		Eastern Washington and northern Idaho		Utah and southern Idaho		Phoenix	
	1946	1947	1946	1947	1946	1947	1946	1947	1946	1947	1946	1947	1946	1947	1946	1947
June	315	310	341	343	282	284	280	311	350	349	286	305	300	294	375	400
July	322	329	336	343	292	296	316	299	367	368	287	297	331	349	385	388
August	324	338	330	351	286	296	208	317	364	372	325	362	361	363	439	475
September	313	321	327	339	285	289	295	314	334	339	296	315	319	312	432	443
October	319	324	349	349	284	286	288	325	365	363	301	326	301	326	346	374
November	320	340	355	371	287	305	287	330	347	364	255	278	289	313	361	437

FREIGHT

Cars of revenue freight, railroad carriers in 11 Western states.

(Compiled from Assn. of Am. R.R. weekly reports)

	Carloadings		Received from Eastern Connections	
	1946	1947	1946	1947
*June	554,501	562,274	267,951	272,144
*July	717,235	755,983	343,600	331,613
*August	694,085	728,578	374,898	381,068
*September	402,592	825,668	394,409	404,771
*October	786,228	701,972	398,110	382,413
*November	662,225	699,897	369,743	340,873
*5-week period				

*5-week period.

BANK LOANS

Industrial, commercial and agricultural (In millions of dollars)

From weekly reporting member banks of Fed. Res. System in 7 Western cities: L.A., S.F., Portland, Seattle, Tacoma, Spokane, and Salt Lake.

(Average of Wednesday reports)

July	1,698
August	1,742
September	1,824
October	1,857
November	1,899
December	1,943

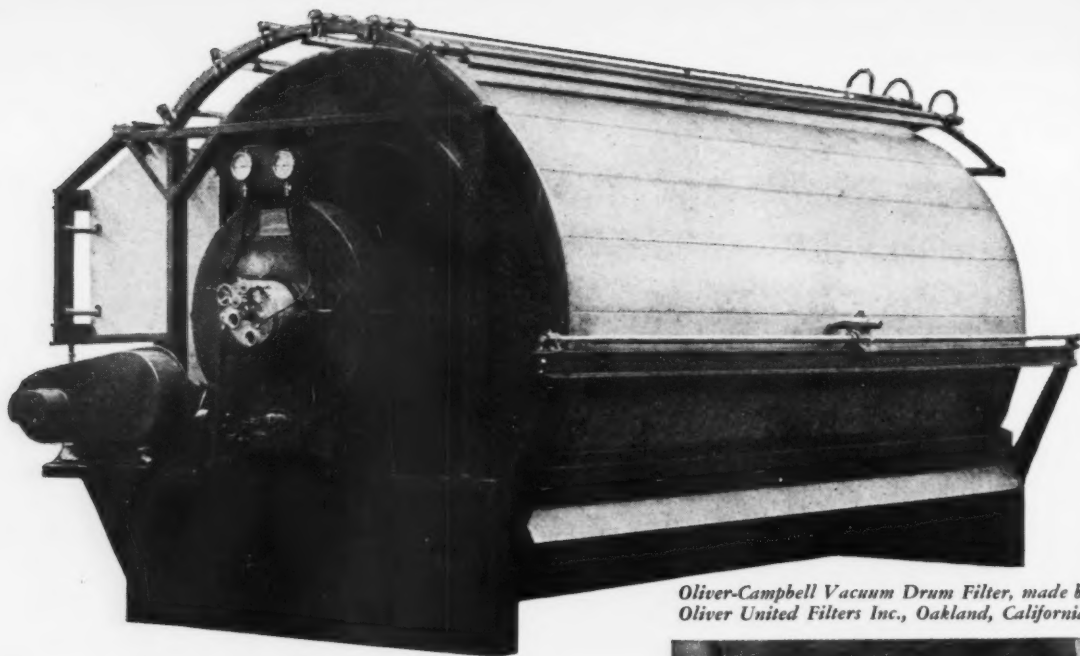
BANK DEPOSITS

(In millions of dollars—adjusted)

Daily average for month, all member banks in 12th Federal Res. Dist. Demand deposits excluding U. S. Gov't deposits, cash items in process of collection, and interbank deposits.

	Net Demand Deposits	Time Deposits
June	8,439	5,885
July	8,439	5,899
August	8,096	5,999
September	8,813	5,920
October	8,905	5,949
November	8,978	5,949

*NET Demand Deposits are now listed instead of Demand Deposits adjusted. U. S. Gov't war loan deposits no longer reported exempt from reserve requirements.

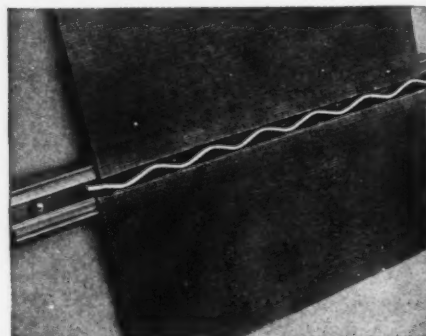


Oliver-Campbell Vacuum Drum Filter, made by Oliver United Filters Inc., Oakland, California.

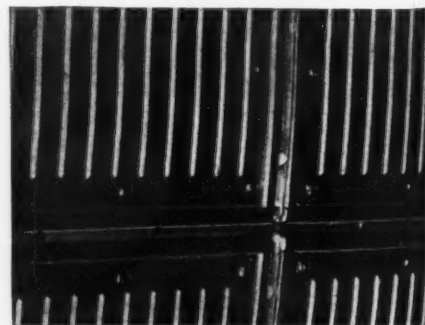
6 types of REVERE METALS in this vacuum drum filter

In the manufacture of this Oliver-Campbell Sugar Cane Mud Filter the following Revere Metals are used: Copper sheet, copper tube, brass sheet, brass discs, brass pipe, and brass extruded shapes. These metals are chosen for three chief reasons: they resist the corrosive action of the filtrate and cake, their mechanical strength is such as to assure durability, and they are quickly and economically fabricated. Use of extruded shapes is particularly interesting from a fabrication standpoint, the rather complicated forms required for the division strip being supplied by Revere in straight lengths that require only cutting and drilling before installation. Similarly, the zig-zag caulking strip that holds the screens is a Revere rectangular extrusion that needs only cutting plus formation of the zigs and zags. The screens, incidentally, are copper sheet, perforated 625 holes to the square inch.

Filtration is an important process, not only in sugar mills, but in a great many industries, such as chemicals, petroleum, coal, paper, cement, mining and refining, breweries, sewage disposal. Often both filtrates and sludges are corrosive, and thus it is that Revere Copper and copper alloys find many important applications. These metals are available in many different alloys and forms, resistant to a wide range of corrosive media. The Revere Technical Advisory Service will gladly collaborate with you in studying the problem of corrosion in your plant equipment or product.



Section showing method of locking copper screen into the extruded division strip by means of a zig-zag brass caulking strip.



Detail of formed or "bumped" brass screen support. The division strips are extruded brass sections.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, New York

Mills: Baltimore, Md.; Chicago, Ill.; Detroit, Mich.; New Bedford, Mass.; Rome, N. Y.—Sales Offices in Principal Cities, Distributors Everywhere. Pacific Coast District Sales Offices in San Francisco, Seattle, Los Angeles

THE WESTERN OUTLOOK...News...Statistics...

3

cents a gallon higher than present levels. He said that "demand for fuels will continue to rise, for over 90 per cent of the locomotives on order are Diesels; domestic oil-burner sales are at the highest rate in history, and fewer automobiles are burning more gasoline than before the war."

U. S. consumption of finished oil products this year amounted to 582 gallons for every man, woman, and child—25.4 per cent more than in 1941. In 1948, the demand is expected to be still higher — totalling about 6,195,000 barrels a day, or 6 per cent above last year's rate and 40 per cent above the 1941 figure.

American Gas Assn. sample figures from three utility operating companies accounting for 89 per cent of the natural gas in the Pacific states show a third quarter gain in 1947 over 1946 of 18.1 per cent in volume, 6.0 per cent in number of customers and 31.7 per cent in revenue. Industrial load volume was up 24.9, but the number of industrial customers was off 6.7 per cent; i.e., 5,253 customers in 1947 as against 5,628 in 1946. There were 111,115 more residential customers than in 1946. Manufactured gas sales by the same three companies increased 3.9 per cent, with industrial volume up 3.3 per cent, but number of customers declined 0.9 per cent.

Natural gas sample figures from the Mountain states were up 12.3 per cent in volume, 10.1 per cent in number of customers and 13.6 per cent in revenues. Industrial volume was up 11.2 per cent and 36 more industrial customers were reported. Number of residential customers was 23,737 greater than in 1946, which may be partly accounted for by change-overs from coal.

With a slight easing of the railroad car shortage, intermountain bituminous coal production crept up slightly during December. In Utah the work week for coal miners rose from an average of four days to between 4½ and 5 days, an increase of 12 to 15 per cent. The upward trend is expected to continue into 1948.

Steel

Further improvement in the steel scrap situation on the Pacific Coast is looked for in the next two or three months when 80 LSTs are

ELECTRIC ENERGY									
(Production for Public Use—In thousands of kilowatt hours. Source: Federal Power Commission)									
	Mountain		Pacific Northwest		California		Total Pacific		
	1946	1947	1946	1947	1946	1947	1946	1947	
May	976,801	1,068,190	989,436	1,346,351	1,467,259	1,674,755	2,456,695	3,021,106	
June	1,085,393	1,263,666	1,075,075	1,363,534	1,540,325	1,759,504	2,615,400	3,123,038	
July	1,005,000	1,154,831	1,000,953	1,286,253	1,628,605	1,848,005	2,629,558	3,134,258	
August	982,553	1,102,713	1,088,455	1,344,586	1,700,150	1,823,537	2,788,805	3,168,123	
September	924,999	1,081,065	1,109,086	1,325,425	1,547,003	1,695,630	2,656,089	3,021,055	
October	992,528	1,059,691	1,251,343	1,422,487	1,523,254	1,654,464	2,774,597	3,076,951	

PETROLEUM

(California, Oregon, Washington, Arizona, Nevada)
(From Bureau of Mines)

TOTAL DELIVERIES (Thousands of barrels daily)									
	CRUDE PRODUCTION (Barrels, daily avg.)		GASOLINE		GAS OIL & DIESEL		HEAVY FUEL OIL		ALL PRODUCTS
	1947		1946	1947	1946	1947	1946	1947	1946 1947
May	912,376		323	332	78	85	351	357	864 912
June	914,215		326	385	76	90	343	362	871 978
July	918,239		329	335	72	88	326	360	859 935
August	917,684		325	370	67	100	355	362	885 985
September	914,747		318	370	77	113	339	386	860 1,030
October	921,463		320	356	100	139	326	375	870 1,010

NATURAL GAS (CALIFORNIA)

(Compiled by Roy M. Bauer, gas supply supervisor, Southern California Gas Company)

	—Number of Consumers—		*Utilization (In thousands of cubic feet)			
	Domestic and Commercial	Industrial	Domestic and Commercial Sales	Industrial Sales	Electric Generation	Net Receipts from Producers
1947						
Avg. Jan.-Mar.	2,241,132	5,706	24,610,137	8,201,146	1,724,543	35,032,085
Avg. Apr.-June	2,264,293	5,615	12,978,115	10,812,647	2,609,401	27,819,226

*Utilization figures do not include company use, storage, and unaccounted for.

sold and broken up. Each LST will yield 1,500 tons, so a total of 120,000 tons would be added to the supply. The Army is also reported accelerating movement of scrap, e.g., tanks from Benecia arsenal.

Chief improvement in the supply picture is the opening of the Kaiser pipe mill at Fontana in January. Capacity is 12,000 tons a month, but it may be many months before that level is reached. Other operations at Fontana were at record levels all through 1947.

An all-time record of finished steel shipments, surpassing even wartime peaks, was rolled up in 1947 by Columbia Steel Company at Pittsburg, Calif. The old record of 293,144 net tons estab-

lished in 1944 was shattered in December, when shipments for the week ending December 20 reached 297,758 net tons.

Nonferrous Metals

Nonferrous metal production held up well during December but a manpower shortage in underground mines continued to keep production below capacity, particularly lead and zinc. The CIO mine and smelter workers union is in a ferment over communism but it is an internal affair and is not likely to affect production in the near future, as most contracts do not come up for renewal until the middle part of 1948.

Permanente Metals Corp. have announced plans for the production of aluminum bar, rod, and wire at Spokane in conjunction with the Trentwood rolling mill. Studies have been conducted during the past year to determine the advisability of further integration of the company's operations, and plans have reached the engineering stage, although no date has been mentioned for actual undertaking of machine installation.

President Roy Hunt of Alcoa estimates primary aluminum production in 1947 as 1,140,000,000 pounds, an increase of more than 30 per cent.

New Jersey Zinc Exploration Co., a prospecting subsidiary of the New Jersey Zinc Co., has opened a regional office in Spokane. E. P. Kaiser, field man in charge, termed the new office a "regional listening post" which mining men consider significant of the growing importance of eastern Washington and northern Idaho as a lead and zinc producing area.

Two bids opened for lease of the magnesium reduction plant at Spokane failed to indicate any significant developments for the immediate activation of the war-built plant. Both bids were so hedged with restrictive and limiting clauses that it seems doubtful that any lease will be granted either bidder.

BITUMINOUS COAL AND LIGNITE

(In thousands of tons. From Bureau of Mines)

	(Colo.-N. Mexico)		(Wyoming)		(Utah)		(Montana)		(Wash.-Alaska)	
May	308	487	362	568	248	632	233	242	55	98
June	503	523	444	608	472	560	300	150	118	107
July	464	298	615	345	548	394	293	182	114	71
August	573	490	736	530	566	504	275	255	132	104
September	679	628	745	650	590	513	343	274	124	116
October	828	640	903*	797	627	505	402	318	151	152

*Includes Idaho.

IRON AND STEEL

Western Area of the United States
From American Iron and Steel Institute (in net tons)

	Pigiron Output	Percent of Capacity	Steel Output	Percent of Capacity
June	186,364	89.3	352,215	88.4
July	177,150	82.4	340,322	82.9
August	204,153	94.7	358,691	87.2
September	188,749	90.7	350,937	88.3
October	193,489	89.8	378,227	92.0
November	184,861	88.6	374,169	94.0

Alloy Steel

	Output	Carbon Ingots, Hot Topped*
June	4,707	12,682
July	2,670	8,447
August	3,994	9,918
September	4,321	7,228
October	5,855	11,769
November	5,318	10,434

*Included in total steel.

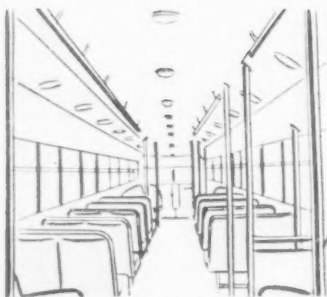
COPPER

(Short tons. From U. S. Bureau of Mines)

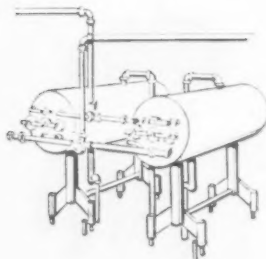
	ARIZONA		UTAH		MONTANA		NEW MEXICO		NEVADA		TOTAL 11 WEST'N STATES	
	1946	1947	1946	1947	1946	1947	1946	1947	1946	1947	1946	1947
May	16,350	31,000	500	25,000	4,800	4,800	3,906	5,368	4,350	4,600	30,682	71,180
June	15,800	30,000	400	26,000	4,700	4,760	3,993	5,400	4,675	3,000	30,643	69,160
July	25,700	32,000	12,350	23,500	4,750	4,600	4,404	5,400	2,100	4,400	51,627	70,012
August	26,475	29,870	13,780	23,620	4,950	4,160	4,098	5,930	3,300	4,430	53,481	68,735
September	28,000	29,800	17,350	23,200	4,700	4,000	3,961	5,810	3,400	4,160	54,233	67,781
October	30,650	30,336	17,700	16,470	4,800	4,690	4,195	5,553	3,600	3,990	61,770	61,544

"Standard" EXCELS IN SOLVING TOUGHEST STAINLESS TUBING PROBLEMS

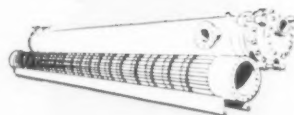
Never in 25 years has the demand for "Standard" welded steel tubing and "Standard's" unsurpassed services in tackling toughest tubing problems been so great. Whether yours is a problem of fabricating—(bending, flaring, flanging, swaging, upsetting or welding)—or of selecting analyses or tolerances, "Standard" is ready to consult and assist you.



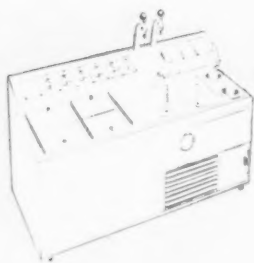
IF YOU HAVE A PROBLEM in Stainless tubing for use in bus, trolley or railroad car, consult with "Standard" experts in tubing "know-how."



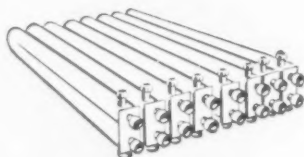
IF YOU HAVE A PROBLEM in Stainless tubing for dairy processing equipment, "Standard" can tell you the best solution for best results.



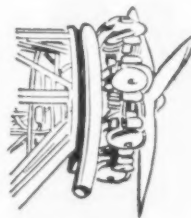
IF YOU HAVE A PROBLEM in Stainless tubing for heat exchangers in chemical and other process plants, call on "Standard" to help you.



IF YOU HAVE A PROBLEM in Stainless tubing for use in soda fountain and beverage dispensing units, let us work out the best answer.



IF YOU HAVE A PROBLEM in Stainless tubing for use in the transmission of corrosive fluids, "Standard" is fully experienced in solving it.



IF YOU HAVE A PROBLEM in Stainless tubing in high temperature applications for aircraft and other uses, "Standard" will help you most.



LAWRENCE-TOTTEN COMPANY, 714 W. Olympic Blvd., Los Angeles 15, Cal.
LAWRENCE-TOTTEN COMPANY, 55 New Montgomery Street, San Francisco 5, Cal.
THE NATIONAL CO., INC., 427 Smith Tower, Seattle 4, Washington
NATIONAL STEEL SALES CO., INC., 815 S. W. Front Street, Portland 4, Oregon
*UNION HARDWARE & METAL CO., 411 E. First Street, Los Angeles 54, Cal.
*THE PACIFIC PIPE COMPANY, 160 Spear St., San Francisco 3, Cal.
*Complete Tube Stocks Maintained at This Point

SIZE AND THICKNESS CHART				
TUBE DIAMETER "O.D. SIZE"	MAXIMUM WALL		MINIMUM WALL	
	DECIMAL	S & W GAUGE	DECIMAL	S & W GAUGE
1/8"				
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Chemicals

Weyerhaeuser Timber Co. is planning to build a new chemical plant in the Pacific Northwest. The plant is to be located near the town of Everett, Wash. The plant is to be built on a 100-acre site. The plant is to be built by Weyerhaeuser Timber Co. and will produce a variety of chemicals. The plant is to be built in 1948.

The Spruce-Pine Lumber Co. is planning to build a new chemical plant in the Pacific Northwest. The plant is to be located near the town of Everett, Wash. The plant is to be built on a 100-acre site. The plant is to be built by Spruce-Pine Lumber Co. and will produce a variety of chemicals. The plant is to be built in 1948.

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Lumber

Sale prices of timber stands in the Pacific Northwest continued high and in general well over previous prices through the end of last year. During December, Douglas fir sold at oral auctions in Oregon and Washington ranged in price from 88 to 100 per thousand in the Olympic Peninsula to \$10.75 in southwestern Oregon. Yellow pine in Idaho brought 89 per thousand in the sale of a relatively small lot by the state. Western red cedar sold by the Forest Service in the state of Washington in oral bidding went to nearly three times the appraised price. The latest sale of the month was 10,000,000 board feet in the Olympic National Forest to the Acme Lumber Co., Hoquiam, Wash.

Weyerhaeuser Timber Co. will cut 100,000,000 board feet of timber annually in the Coast Range area when the company's operations there get under way next year. The cut is based on a 100-year operation with a factor of safety of 5,000,000 board feet per year.

Red cedar shingles, produced exclusively in the Pacific Northwest, reached a new high in production last year when an estimated 6,000,000 squares were manufactured. The production value for 1947 was 4,500,000 squares.

LUMBER

(In thousands of board feet)

From West Coast Lumbermen's Association: Douglas Fir, Sitka Spruce, Port Orford Cedar, West Coast Hemlock, Western Red Cedar.

Production 1945 1946 1947
1,051,100 1,001,720 1,708,635

From Western Pine Association figures (Idaho White Pine, Ponderosa, Sugar Pine and associated species):

Production 1945 1947
2,000,570 2,000,735

Plywood

Three prospective plywood mills have been announced as being planned for immediate construction during the past month. Gordon-Laffey Co., Hoquiam, Wash., plans a small mill at Hoquiam. Hardell Plywood Co., Olympia, Wash., will construct a mill as an adjunct to the Delson Lumber Co. and utilize excess material from the lumber mill. North Plywood, Inc., Seattle has purchased a building near Spokane and announced plans to install manufacturing equipment.

SOFT PLYWOOD

(From Bureau of the Census
In thousands of square feet)

	1946	1947
April	120,152	138,027
May	154,180	141,752
June	121,432	139,623
July	95,752	104,487
August	129,631	117,042
September	129,270	146,953

Pulp and Paper

Crown Zellerbach will install three machines to process wood pulp for wet strength as a means of increasing the capacity of their mill at Port Townsend, Wash., by 25 tons per day. Shortage of softwood capacity has caused a sharp drop in pulp production in the Northwest and some producers are expected to have been utilizing highway truck transportation when possible.

Pulp mills ended the year with four months' inventory in rough pulpwood. Average stocks were estimated at close to a million cords, more than double that of a year ago and 500,000 cords more than the previous inventory. Consumption averaged around 200,000 cords per month for the last half of the year, 42 per cent above 1946. In the first nine months of 1947, Northwest mills received 88 per cent more rough pulpwood from the productive months in 1946.

PULPWOOD

(Pacific Northwest)

(Cords of 128 cu. ft. roughwood basis)

Source: Bureau of the Census

	Receipts	Consumption
May	457,888	269,966
June	578,510	265,892
July	362,477	344,851
August	295,121	269,009
September	179,427	294,641
October	114,639	281,751

Furniture

The Census Bureau has come up with statistics on furniture and bedding products, the latter classification including metal beds, bedsprings, Hollywood beds, head boards, studio couches, sofa beds and other dual purpose furniture. Some day they may even have statistics on featherbedding, and eventually perhaps may report the number of feather mattresses, a feature in which countless ex-GIs will be tremendously interested.

Manufacturers' shipments for the West, in thousands of dollars (subject to sampling errors), are as follows:

(Values in thousands of dollars)

	Total	April	May	June	July
1947	1,701	1,721	1,602	1,617	1,701
1946	1,701	1,721	1,602	1,617	1,701

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Building Materials

The National Bureau of Economic Research has issued a report on the building materials industry. The report shows that the building materials industry is expected to have a good year in 1947. The report also shows that the building materials industry is expected to have a good year in 1948.

	Dec 1946	Sept 1947	Oct 1947	Nov 1947
Building materials	114	114	114	114
Construction cost index	114	114	114	114
Construction cost index	114	114	114	114

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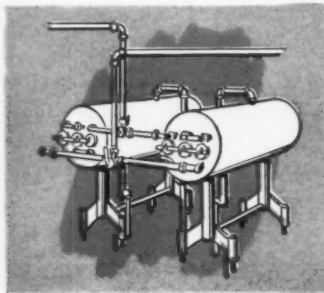
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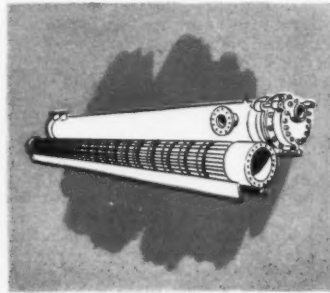
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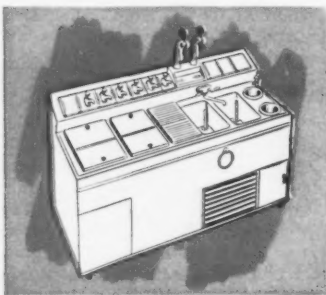
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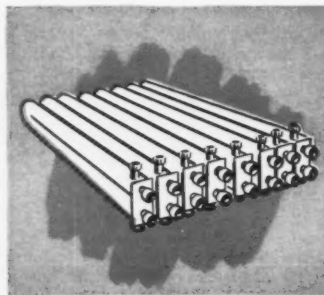
IF YOU HAVE A PROBLEM in Stainless tubing for dairy processing equipment, "Standard" can tell you the best solution for best results.



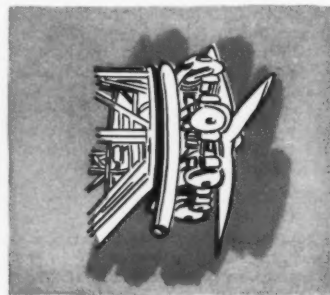
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LAWRENCE-TOTTEN COMPANY, 55 New Montgomery Street, San Francisco 9, Cal.
THE NATIONAL CO., INC., 427 Smith Tower, Seattle 4, Washington
NATIONAL STEEL SALES CO., INC., 815 S. W. Front Street, Portland 4, Oregon
UNION HARDWARE & METAL CO., 411 E. First Street, Los Angeles 54, Cal.
THE PACIFIC PIPE COMPANY, 160 Spear St., San Francisco 5, Cal.

SIZE AND THICKNESS CHART

TUBE DIAMETER "O.D. SIZE	MAXIMUM WALL		MINIMUM WALL	
	DECIMAL	S. W. GAUGE	DECIMAL	S. W. GAUGE
3/8"	.375"	20	.025"	23
1/2"	.500"	18	.025"	23
5/8"	.625"	18	.025"	23
3/4"	.750"	18	.025"	23
7/8"	.875"	18	.025"	23
1"	1.000"	18	.025"	23
1 1/8"	1.125"	14	.025"	23
1 1/4"	1.250"	14	.025"	23
1 3/8"	1.375"	14	.025"	23
1 1/2"	1.500"	14	.025"	23
1 5/8"	1.625"	13	.025"	23
1 3/4"	1.750"	13	.025"	23
1 7/8"	1.875"	13	.025"	23
2"	2.000"	13	.025"	23
2 1/8"	2.125"	13	.025"	23
2 1/4"	2.250"	13	.025"	23
2 3/8"	2.375"	13	.025"	23
2 1/2"	2.500"	13	.025"	23
3"	3.000"	13	.025"	23

*Intermediate sizes within the range indicated can also be manufactured. Please consult us for sizes not listed.
Available in all grades of chrome-nickel steels, such as types 302, 304, 316 and 347.

Chemicals

Westvaco Chlorine Products Corp. has announced plans for completion by early 1949 of an electrical furnace for the production of metallic phosphorus near Pocatello, Idaho. The plant is the result of experimental work conducted during the past two years by the J. R. Simplot Co. and the Idaho Power Co., and will provide the Simplot company with elemental phosphorus for the manufacture of fertilizer.

The Springfield, Ore., wood chemical plant is scheduled to come up for sale or lease by the War Assets Administration during the latter part of February. About 200 inquiries have been received concerning sale of the plant, according to WAA officials. Arrangements for inspection of the plant can be made at the Portland office of WAA.

Because recent power shortages on the West Coast have resulted in losses of anticipated ammonium nitrate production, 3000 tons of which were destined for export under the world-wide distribution recommended last spring by the International Emergency Food Council, the Office of Materials Distribution is asking producers in other areas to supply this export amount.

Lumber

Sale price of timber stands in the Pacific Northwest continued high and in general well over appraisal prices through the end of last year. During December, Douglas fir sold at oral auctions in Oregon and Washington ranged in price from \$8.10 per thousand on the Olympic Peninsula to \$16.75 in southwestern Oregon. Yellow pine in Idaho brought \$9 per thousand in the sale of a relatively small lot by the state. Western red cedar sold by the Forest Service in the state of Washington in oral bidding went to nearly three times the appraised price. The largest sale of the month was 46,000,000 board feet in the Olympic National Forest to the Acme Door Co., Hoquiam, Wash.

Weyerhaeuser Timber Co. will cut 100,000,000 board feet of timber annually in the Coos Bay, Ore. area when the company's operations there get under way next year. The cut is based on a 100-year operation with a factor of safety of 3,000,000 board feet per year.

Red cedar shingles, produced exclusively in the Pacific northwest, reached a new high in production last year when an estimated 6,000,000 squares were manufactured. The production figure for 1945 was 4,500,000 squares.

LUMBER

(In thousands of board feet)

From West Coast Lumbermen's Association (Douglas Fir, Sitka Spruce, Port Orford Cedar, West Coast Hemlock, Western Red Cedar):

Year through	1945	1946	1947
Production	5,551,193	6,604,720	6,708,635

From Western Pine Association figures (Idaho White Pine, Ponderosa, Sugar Pine and associated species):

Year through	1946	1947
September Production	2,003,573	2,068,795

Plywood

Three prospective plywood mills have been announced as being planned for immediate construction during the past month. Gordon-Ladley Co., Hoquiam, Wash., plans a small mill at Hoquiam; Hardel Plywood Co., Olympia, Wash., will construct a mill as an adjunct to the Delson Lumber Co. and utilize excess material from the lumber mill; North Plywood, Inc., Seattle, has purchased a building near Spokane and announced plans to install manufacturing equipment.

SOFT PLYWOOD

From Bureau of the census
(In thousands of square feet)

	1946	1947
April	120,152	148,027
May	128,489	141,753
June	121,412	139,633
July	95,734	104,487
August	126,631	137,042
September	129,270	146,985

Pulp and Paper

Crown-Zellerbach will install three machines to process wood pulp for wet shipment as a means of increasing the capacity of their mill at Port Townsend, Wash., by 25 tons per day. Shortage of railroad cars since late summer has hampered pulp production in the northwest, and some producers are reported to have been utilizing highway truck transportation where possible.

Pulp mills ended the year with four months inventory in rough pulpwood. Aggregate stocks were estimated at close to a million cords, more than double that of a year ago and 200,000 cords more than the prewar inventory. Consumption averaged around 265,000 cords per month for the last half of the year, 12 per cent above 1946. In the first nine months of 1947, Northwest mills received 38 per cent more rough pulpwood than the comparative months in 1946.

PULPWOOD

(Pacific Northwest)

(Cords of 128 cu. ft., roughwood basis.
Source: Bureau of Census)

	Receipts	Consumption
May	457,888	269,966
June	578,510	265,892
July	362,477	344,851
August	395,124	269,009
September	459,427	264,641
October	334,649	281,753

Furniture

The tireless Census Bureau has come up with statistics on furniture and bedding products, the latter classification including metal beds, bedsprings, Hollywood beds, head boards, studio couches, sofa beds and other dual purpose furniture. Some day they may even have statistics on featherbedding, and eventually perhaps may report the number of feather merchants, a figure in which countless ex-GIs will be tremendously interested.

Manufacturers' shipments for the West, in thousands of dollars (subject to sampling errors) are as follows:

	(Values in thousands of dollars)
Total, four quarters	April 1947, Jan. 1946, May 1947, Dec. 1946, July 1947, Sept. 1946
Mtn. states	1,527 1,174
Pacific	39,183 37,791
Total West	149,929 34,151 36,103 40,170 38,965

The April-June figures for the West have been broken down as follows: household furniture, total, 27,970; upholstered furniture, 10,363; other household furniture, 17,607; bedding products, total, 6,181; dual purpose, 3,189; other bedding products, 2,992.

WHEAT FLOUR

(In thousands of sacks; from Bureau of the Census)

	Ore.-Wash.	Montana	Utah-Idaho	Colorado	California	Total
May	1,701	362	484	467	362	3,376
June	1,721	342	489	432	409	3,392
July	1,602	356	293*	458	445	3,154
August	1,613	362	317*	467	368	3,127
September	1,498	352	327*	462	321	2,960
October	1,760	336	322*	484	447	3,349

*Utah only.

Building Materials

Pacific Northwest (Wash., Ore., Idaho) had the highest third quarter non-residential construction record in history, according to Equitable Savings & Loan Society, Portland. Total building for first nine months off 9 per cent from 1946. Construction cost indices for four Western cities, as reported by American Appraisal Company, show the same gradual rise in November as in previous months, as follows (indices reflect cost trend in each city, but not the relative trend between cities):

	Decontrol Nov. 1946	Sept. 1947	Oct. 1947	Nov. 1947
Denver	326	414	417	420
Seattle	351	470	473	475
San Francisco	323	424	427	429
Los Angeles	344	405	448	450

Ceramic tile production in California in 1947 was 17,600,000 sq. ft., an increase of 6,024,000 over 1946, according to R. F. Bailey, West Coast advisory committee member of the Tile Council of America. He reports shortage of tile setters being relieved by training schools, one of them alone graduating 72 pupils a few weeks hence.

Demand has slackened somewhat for small sewer pipe for house connections, but continues unabated for sewer mains. Deliveries are catching up and some backlog is being build up.

The cement production picture is about as a year ago, some cement going into storage, but the usual winter decline being absent, with prospects that a building boom in the spring would catch everybody short. Last spring, however, the increase in demand was gradual and the mills managed to keep up.

STRUCTURAL CLAY PRODUCTS

	UNGLAZED BRICK (In thousands of standard brick)	UNGLAZED STRUCTURAL TILE (short tons)	VITRIFIED CLAY SEWER PIPE (short tons)
May	13,780	24,355	2,687
June	14,702	26,503	2,706
July	13,740	29,098	2,325
August	14,807	31,623	2,750
Sept.	12,168	28,267	3,814
Oct.	9,701	23,160	2,426

*Includes Colorado.

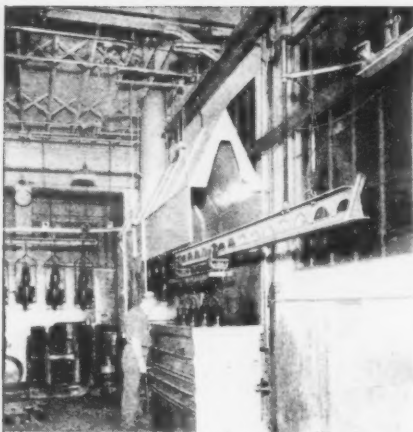
ASPHALT ROOFING

(Ariz., Calif., Idaho, Nev., Ore., Utah, Wash.)

	ASPHALT ROOFING (Sales squares)	SATURATED FELTS (Tons of 2000 lbs.)
May	811,578	4,799
June	797,995	5,444
July	725,892	5,513
August	775,095	.....
September	862,859	.....
October	962,678	.....

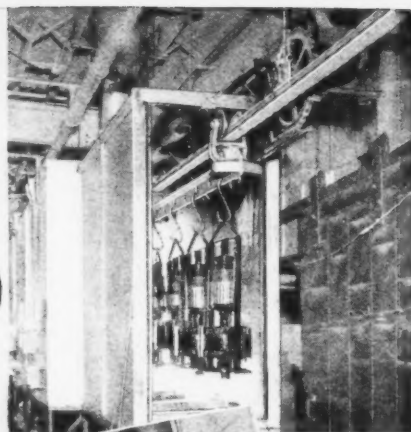
Flour

Some of the largest bakeries have been riding out the season on a day-to-day buying basis, hoping for a drop in flour prices. As the crop seems to have been larger than expected, and domestic business with the mills is down possibly 20 per cent, possibility now appears that prices may go either up or down.



After draining, armatures are advanced to oven. Carriers are traveled slowly through oven by motor-driven chain drive.

DIP- BAKE- DRY



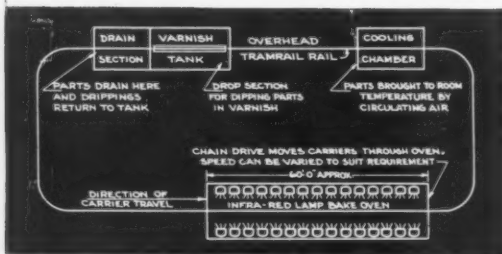
Armatures are dipped into varnish by use of a tramrail drop section which later is raised permitting carrier to travel forward.

It's FAST,
CLEAN
and
EASY



In cooling chamber armatures are cooled to room temperature.

with this Simple Overhead System



Many man-hours are saved by a simple, efficient and inexpensive overhead loop Cleveland Tramrail system in the Varnish Insulation Department of the Arrowhead Plant of D. W. Onan & Sons, Minneapolis, large manufacturer of electrical generating plants.

Armature and other parts are dipped in varnish, drained, baked and air cooled without manual handling. Only when they are hung onto or taken off the tramrail carriers need they be handled. Every trip around the loop completes a varnish application.

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CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
8813 East 284th Street Wickliffe, Ohio

CLEVELAND  TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Canning

California's canned tomato pack for 1947 was an all-time high, 5,895,500 cases, more than 800,000 cases above 1946, but tomato juice dropped from 9,267,000 cases in 1946 down to 5,558,922 last year. Tomato sauce and hot sauce output was down about 1,500,000 cases. Canned tomatoes are not moving out as rapidly as a year ago and canners' holdings are larger.

California pack figures and stocks on hand as of Dec. 1, 1947 for the individual canned tomato and tomato products reported by the Canners League of California are as follows:

Item	1947 Pack	Stocks on hand, Dec. 1, 1947, sold and unsold
Tomatoes, round:		
Fancy	1,556,095	1,132,089
Extra standard	1,246,993	963,513
Standard	2,794,227	1,628,108
Total, round	5,597,315	3,723,710
Tomatoes, Italian	298,185	93,644
Total, all tomatoes	5,895,500	3,817,354
Tomato juice	5,753,035	5,808,647
Tomato paste	5,558,922	*
Tomato puree	2,268,463	*
Tomato sauce and/or		
hot sauce	3,702,472	3,027,449
Tomato catsup	7,191,561	4,041,497
Tomato chili sauce	783,077	521,179
Other tomato products	143,589	*

* To be compiled as of Jan. 1, 1948.

California pear pack for 1947, including a small quantity of Northwest pears packed in California canneries, was 1,459,879 cases. Between June 1 and Dec. 1, 951,439 cases were shipped, leaving 579,296 cases on hand.

Other California canned fruit stocks as of Dec. 1 are reported by the Canners League as follows:

Apriots	911,885
Cherries	11,807
Free peaches, cases (No. 2½ can basis)	589,024
Cling peaches	5,323,119
Fruits for salad	85,933
Fruit cocktail	2,588,983
Mixed fruits	207,565

The heaviest California tuna pack on record, estimated at 5,000,000 cases, 750,000 cases above 1946, partially offsets the short sardine catch. The mackerel pack is running 300,000 cases above 1946. Sardine tonnage up to Dec. 11 was 95,640 tons, about half of the 1946 return to the same date.

Oregon state fish commission has for the first time limited the size of chinook salmon that may be caught on trolls in state waters. Beginning this year no chinook under 27 inches in length may be taken or brought into the state from the Pacific Ocean for canning, processing, or sale.

Sugar

Cane sugar refining operations in the California refineries slowed down somewhat over the year end because of inventory taking and because purchasers had put a lot of sugar in storage before the price advance in October.

Meat

Although the meat market continues strong, hides have turned weak, and some supplies are not moving. Lard is scarce and firm. The kill of beef and lamb over the year end was short, but the kill of hogs was stepped up considerably after December 1.

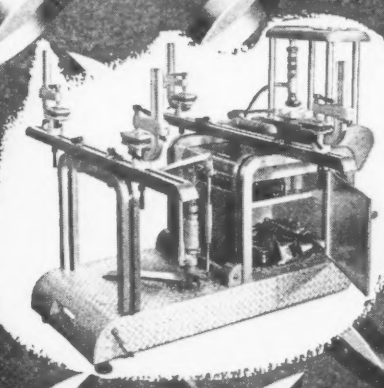
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Usual seasonal dislocations are much less marked this winter. Much fall merchandise was shipped so late it almost immediately was followed by the first spring goods. The tardy shipments were due in large part to hesitation of merchants in placing orders early in 1947.

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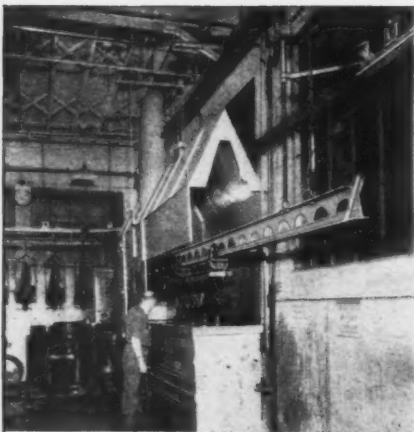


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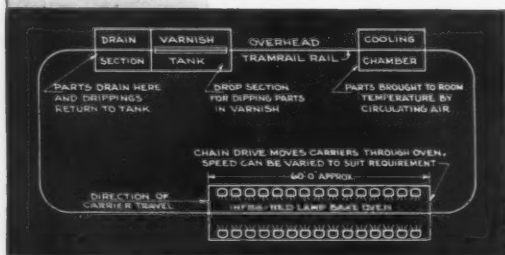


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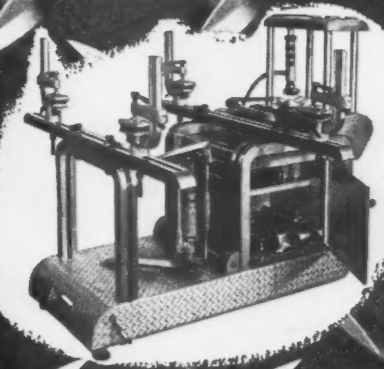
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Manpower—or rather, womanpower—shortages are cramping the style of Western garment manufacturers. Growth of the industry has created a need in the Los Angeles area alone for an estimated 5,000 additional experienced needlewomen. A training program financed jointly by the industry, city, and state is under way to relieve the situation.

Usual seasonal dislocations are much less marked this winter. Much fall merchandise was shipped so late it almost immediately was followed by the first spring goods. The tardy shipments were due in large part to hesitation of merchants in placing orders early in 1947.

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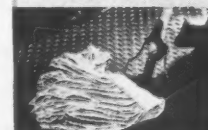
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WITH SCIENTIFIC SUNLIGHT CONTROL

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SUNLIGHT, HEAT & GLARE
with Old-fashioned methods
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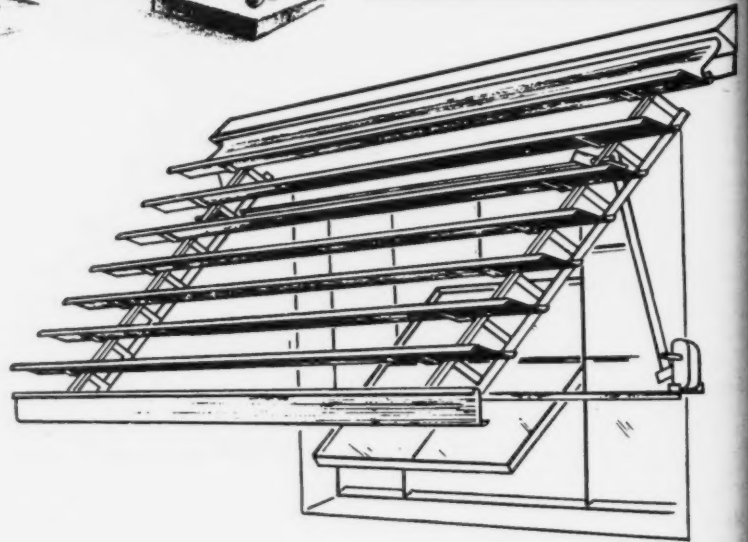
When shades or awnings are down, or when you use painted glass, your workers cannot take advantage of natural light.

a WINDY room

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Spotlight

on the NEWS

WESTERN INDUSTRY
FOR FEBRUARY, 1948

VOLUME XIII

NUMBER 2



Exporting to the Orient via Atlantic and Gulf ports is a package deal: you know the whole cost before you start, rail, water and port charges. Exporting via Pacific Coast ports is a grab bag: you think you are getting a combination rate plus saving \$4 a ton in freight rates, but you can't figure out until after it is all over what the port charges against you will be. Bills for service, handling, car unloading, etc., come trickling in long after your cargo is afloat on the Pacific.

When Maitland Pennington, vice-president of Pacific Transport Lines, Inc., touched off this bombshell at the California State Chamber of Commerce meeting in December, the explosion brought the result he hoped for: a Western Transportation Conference for the entire Coast, steamships, railroads, truckers, airlines, port authorities, terminal operators, to be held in San Francisco February 20. After that session it may no longer be considered smart to toss the \$4 freight advantage out the window.

Here's an example cited by Pennington (not an isolated case either): traffic manager for a Detroit automobile manufacturer who formerly shipped to the Orient via San Francisco or Los Angeles now patronizes Atlantic or Gulf ports entirely. Why? Because six months after a West Coast shipment he got bills for \$10,000 extra charges which his own company had to stand because it was too late to pass them on to the proper people.

Two other factors work against us: (1) fear of having cargoes tied up for days, weeks or months by labor strife; (2) the other coasts try harder to get the business.



Farm Chemurgy Dream

Farm chemurgy dreams (a million dollars worth) of hundreds of wheat and potato growers vanished a few weeks ago when the North-

west Chemurgy Cooperative with plants at Ellensburg, Wenatchee and Hatfield (in the Klamath Basin, just inside California's northern border) went into receivership. Main trouble, so the experts say, was sticking to glucose and starch alone, instead of utilizing all the raw material, for example, protein, which makes up 8 to 10 per cent of the wheat.

But Leo M. Christenson, a Nebraska chemical engineer, reported to the co-op that for \$1,000,000 to \$1,500,000 investment a plant with 10,000 bushels daily wheat capacity could turn out products worth \$3.59 at present prices from each bushel at a conversion cost of 30 to 60 cents. The yield would include: 5 pounds of gluten at 18c a pound, 3.1 gallons of alcohol at 45c, 21 pounds of feed at 4c and 15 pounds of dry ice at 3c. Even at prewar prices of 75c a bushel for wheat, the products would return about \$1.74 a bushel.



Dead Ducks Revive

Surprising what a lot of life there is in some of the "dead duck" war plants scattered through the West. Sooner or later good buyers turn up for all of them.

Deadest dead duck of them all seemed to be the Alcoa aluminum reduction works at Torrance, California, but now Columbia Steel has bought it (subject to approval of the attorney general, who may be suit-happy now that the Supreme Court has agreed to review the Consolidated Steel case that he lost). Columbia pays \$4,200,000 and will use it for their projected \$30,000,000 Southern California cold roll steel mill.

Western Electro-Chemical has raised to \$25,000,000 the ante on Basic Magnesium in Nevada, into which the government poured \$140,000,000. WAA had offered it to the state of Nevada for \$24,000,000, on the basis of \$1 down and the balance out of profits over 20 years. Western proposes to pay \$2,000,000 or \$3,000,000

down. And Jack Simplot is about to get the Kalunite alumina plant at Salt Lake City to make fertilizer by meeting the American Potash bid of \$752,000 (American being classed as a monopoly and therefore ineligible), with Columbia Metals being given a whack at another wartime alumina plant at Salem, Oregon.



Save the Pennies!

Clang went the fire alarm and 500 W. J. Voit Rub Corp. employees at Los Angeles quietly marched out. Six minutes later they marched back in. Just a fire drill.

Then real excitement broke loose. Pennies began to turn up in molds, machinery, assembly lines, chutes, packing cases, scales, desks, papers and other obscure and surprising places. Fifteen minutes of wild scrambling by the entire force netted them over \$300 worth of the coppers, apparently planted during the drill.

"Just the start of a campaign to prevent waste," explains Page Parker, production vice-president. "We are out to demonstrate that a couple of million pennies can be saved each year by each worker's more effective use of his time and materials. Many thousands of dollars we can save are right under our noses."



The B.T.U. Trail

That "cheap B.T.U." which Paul McKee says is the Pacific Northwest's greatest need, is coming a little nearer. Northwest Natural Gas Company of New York will build a 24-inch natural gas pipeline from the Alberta fields to Portland, Seattle, Spokane, and Vancouver, B. C.

Also, University of Washington has started research on possibilities of converting low-grade southwestern Washington coal into gaseous fuel to replace artificial gas from oil; and converting this fuel into a synthetic gasoline.



Have You Called Our Number?

We're still pretty new on the West Coast, so we thought we'd remind you how to get in touch with our new Los Angeles plant when you need steel. The present great demand for steel products prevents us from promising that we'll always be able to meet your requirements, but you can rest assured we'll do our very best.

Since we opened our Los Angeles plant about a year ago, we've been doing a lot of expanding. We've added many new kinds and sizes of steel, and, as rapidly as possible, we're specializing our stocks to meet the particular needs of West Coast industry.

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We're anxious to become better acquainted with your steel needs. The more we know about the material you require, the faster we'll be able to supply you. There's a good chance that we've got what you're looking for today—right here in our Los Angeles stocks. So write, wire or phone us. We'll be ready to work with you.

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Bars—hot and cold rolled alloy steel reinforcing	Mechanical Tubing Boiler Tubes and Fittings Allegheny Stainless—sheets, plates, shapes, bars, tubing, etc.	Tool Steel Wire, Chain Bolts, Rivets Babbitt Metal Working Tools & Machinery, etc.
Structurals Plates—Inland 4-Way Floor Plate	Sheets and Ship Steel	

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PICTURE OF THE MONTH



THE INDUSTRIALIZED WEST . . . While the aircraft industry faces drastic financial difficulties, Boeing Aircraft Co., Seattle, is increasing production. Shown above are wing assembly line (foreground) and final assembly operations on C-97 Stratofreighters, Stratocruiser and (far right) B-50 bombers. C-97's and B-50's are for USAF. Stratocruisers for airlines.

Plugging the Holes in Industry-Wide Bargaining

By J. D. RICE

Manager, Dairy Industry Industrial Relations
Association, Los Angeles

INDUSTRY-WIDE labor agreements, covering many different companies and physically separated operations of the same company, present numerous problems. Not the least of these is the attainment of uniform understanding and administration of the agreement by all personnel of union and management having to do with the practical day-by-day operation of the contract.

Labor contracts are almost invariably negotiated by a committee representing the

employers and a similar committee representing the union or unions involved. After full agreement on all points under discussion the joint committee reduces the agreement to words that will finally appear as a printed contract.

At this point the members of the committees representing management and union usually have a complete understanding of the meaning and intent behind the various clauses in the contract. But from here on the difficulties commence. The written contract now goes out to plant

managers, plant superintendents, sales managers, foremen, supervisors, timekeepers, shop stewards and union business agents, all of whom have their part in applying the agreement to the day-to-day problems that arise under every union agreement, regardless of how careful the authors have been.

Strong representatives of one side, faced by weak representatives of the other, twist the meaning of a clause to meet their personal beliefs or desires, reading into it meanings completely foreign to the intent

of the negotiators. Well-meaning but careless or ignorant representatives of both sides misinterpret the agreement.

All too often these things occur without the knowledge of top representatives of either management or the union, but the net results are always the same: frayed tempers, molehill grievances that grow into mountains, accusations of bad faith by both parties. When the contract is reopened for negotiations all of these lead to demands from both sides that lengthen and complicate an agreement probably too long and complicated already.

A brief description of the background of our industry and its relationship with the unions representing our employees will probably be helpful in evaluating what we have done to meet this problem.

The dairy industry in this area has been dealing with unions on an industry-wide basis for some eight years. We have never had a strike or work stoppage. There is mutual respect between representatives of the unions and industry. Each side believes it is the desire and the intention of the other to live up to the letter and the intent of our agreement. This does not mean hot disputes, misunderstandings and near strikes have not occurred, but each time a negotiated conclusion reasonably fair to both sides has been reached.

Our present contract with the Teamsters' organization covers eight counties in southern California and eight separate local unions. It affects 26 companies and some 72 operations geographically separated from each other.

After considerable study of the problem it was decided to issue a contract manual, which would set forth in detail industry's understanding of the practical meaning of the contract.

As the "Foreword" in the manual expresses it:

"It is generally conceded that good collective bargaining procedures demand that union contract resulting from negotiations between the employers and the union should be kept as brief as clarity of meaning will permit. As a result it has often developed that only members of the negotiating committees are in possession of the full thought, background and development of the articles and provisions of a union contract.

"This year the negotiating committee representing the employers during the Teamster negotiations has undertaken to explain more fully the exact meaning and intent of the contract as they understand it, and this Manual is the result.

"It is the hope of your Association that you will find this Manual of assistance in your daily work with matters pertaining to the contract.

"As time goes on new problems will arise and errors of omission and commission in this Manual will be discovered. For this reason it is being issued in loose-leaf form and it is planned to keep it constantly up-to-date."

After deciding to issue the manual it was believed necessary to adopt a policy that would govern its preparation and issuance. This policy was as follows:

1. That it was proper for management to issue a statement of their understanding of the contract.
2. That it was a responsibility of management to make this statement as fair and



J. D. Rice

as objective as was humanly possible.

3. That, in order to effectuate the first two principles above, just as much care should be taken to point out the responsibilities of management in connection with provisions of the contract as would be taken in pointing out the responsibilities of the unions.

4. That not only should the contract itself be interpreted but that various practices which have grown up in our industry in connection with union affairs and which, because of long usage, are just as much a part of our agreement as though written therein, should be described.

Boiled down, this means that management felt the manual should be issued with complete honesty of purpose and intent.

It was the sincere belief of our industry that, if such a manual could be produced in keeping with the principles set forth above, it would improve the good relationship between industry and union and promote common understanding of their mutual problems.

How Preparation Began

After the policy had been determined the actual preparation of the manual began. The manager of the association which negotiates labor agreements for the industry was assigned the task of writing the first draft. As rapidly as it was dictated copies of the material were sent to all members of the negotiating committee who were present at the time the agreement was made. This method enabled each member of the committee to receive the material sufficiently in advance so that he could read and digest it, and make notes of suggested deletions, additions or changes.

After the complete first draft of the manual had been dictated and sent out, a two-day meeting of the negotiating committee was held, and the subject matter, phraseology and various interpretations were thoroughly discussed.

Whenever there was a difference of opinion the matter was threshed out until unanimous agreement was reached.

During the original dictation of the rough draft, whenever a question arose to the mind of the manager as to what was the actual practice of the industry, a questionnaire was sent to the entire membership of the association, requesting information concerning their actual practice under the agreement. The information thus received was available to the committee at the time the final decisions were reached.

In passing it might be said that interesting situations were brought to light through this process. For instance, it was found that in one company three different interpretations of one clause in the contract were in use, and this situation was found to be not unusual.

In reaching decisions concerning industry's interpretation and practice the following method was followed: If an overwhelming majority of the industry felt

SAMPLES OF INFORMATION FROM MASTER DAIRY AGREEMENT

Sec. 2. (M.D.A. Page 7) *Night Work Premium*. This section is self-explanatory but an illustration may be of some assistance:

Example: A plant employee in Br. 1 starts to work at 12 noon and works straight through to midnight. He is paid as follows:

12 noon to 6 p.m. at straight time day rate.....	\$1.50
6 p.m. to 8 p.m. at day rate (\$1.50) plus night premium (8c).....	1.58
8 p.m. to 10 p.m. at overtime rate (\$2.25) plus night premium (8c).....	2.33
10 p.m. to midnight at overtime rate (\$2.25) plus overtime night prem. (12c).....	2.37

Note: For the contract provisions regarding Night Overtime Rate see Section 4, ARTICLE VII.

Sec. 3. (M.D.A. Page 4) *Hours*.

Sub-Sec. (a) This clause is self-explanatory. However, if it is necessary for the employee to change his clothing before starting to work it is proper for the Employer to require the employee to do so on his own time and to punch the clock at the time designated by the Employer, and to go to work immediately thereafter. If the employee desires to change his clothes before going home it is proper for the Employer to require him to punch the clock at the end of the eight-hour day and to change his clothes on his own time.

Sub-Sec. (b) This clause is self-explanatory, but by usage over the past several years the dairy industry has amended the original intent of the clause to cover cases where an employee has been called in to work on one of his regular days of rest. In such cases the Industry observes the following practice:

If a man is called in to work on his regular day of rest and works four hours or less he is paid four hours' time at the overtime rate. If he works more than four hours he is paid time and a half for an entire eight-hour shift, whether he actually works eight hours or not. However, where the employee works more than four hours the Employer has the right to require him to work the entire eight hours, and if the employee should choose not to work the entire eight hours he would then be paid only for the hours actually worked.

lowed a certain practice, and it had not been challenged by the union, it was assumed that the practice was established, even though a minority disagreed.

If approximately 50 per cent of the industry followed one practice and 50 per cent another in interpreting the same clause, then it was assumed that the section concerned was possibly ambiguous, and it therefore received particular scrutiny from the committee to determine what, in their opinion, had been in the minds of the negotiators when the clause was written.

After this meeting the material was placed in the hands of the manager and he was assigned the task of rewriting and editing in accordance with the ideas of the committee. The manager collected information for the committee and gave his opinions, as one of the negotiators, but all final decisions were made by the negotiating committee.

The final preparation of the manual then began. It would be difficult to explain in detail just how this was accomplished, but the following quotation from the preface may serve to give an idea of the plan and arrangement:

"Because the Manual is to be issued in conjunction with the Master Dairy Agreement, a copy of the printed contract has been placed directly before the mimeographed pages of the explanation of the contract as given in the Manual. Obviously anyone dealing with a union contract should first read the contract itself and then the explanation of the meaning of the contract.

"For your greater convenience each page of the Manual deals with only one section of an Article of the contract, and each such page refers you back to the page of the

Master Dairy Agreement (M.D.A.) upon which the section under discussion can be found.

"Foresee of reference also, and since it was impractical to make index tabs for each Article and each Section, or each subject as treated in the Manual, a method of page numbering was devised to identify completely the Article and Section discussed on each page.

"For instance: the page which is numbered T-IV:400 indicates that you are looking at a page of the Teamster (T) Contract Manual, and that Article IV (IV) Section 4 (400) is discussed on that page. If you wish to find a clause and do not know the Article or Section number under which it is covered in the Master Dairy Agreement, please refer to the Index of the Teamster Contract Manual (pages 5, 6 and 7) where all Articles and Sections of the contract are listed by number and subject, with their corresponding page numbers in the Manual."

Advance Orders Taken

A bulletin was then sent out to the industry asking members to indicate the number of copies they would require. When the advance orders had been received the physical preparation of the book got under way.

At the time the manual was issued to the industry copies were sent to all of the eight union secretaries concerned, accompanied by a letter explaining the intent of the manual and requesting a meeting with the secretaries to discuss it, and to receive any comments or suggestions they might have.

The manual has been in the hands of the industry too short a time for us to know what the ultimate results will be,

but we have had a few interesting reactions from unions and management.

Revisions Non-Controversial

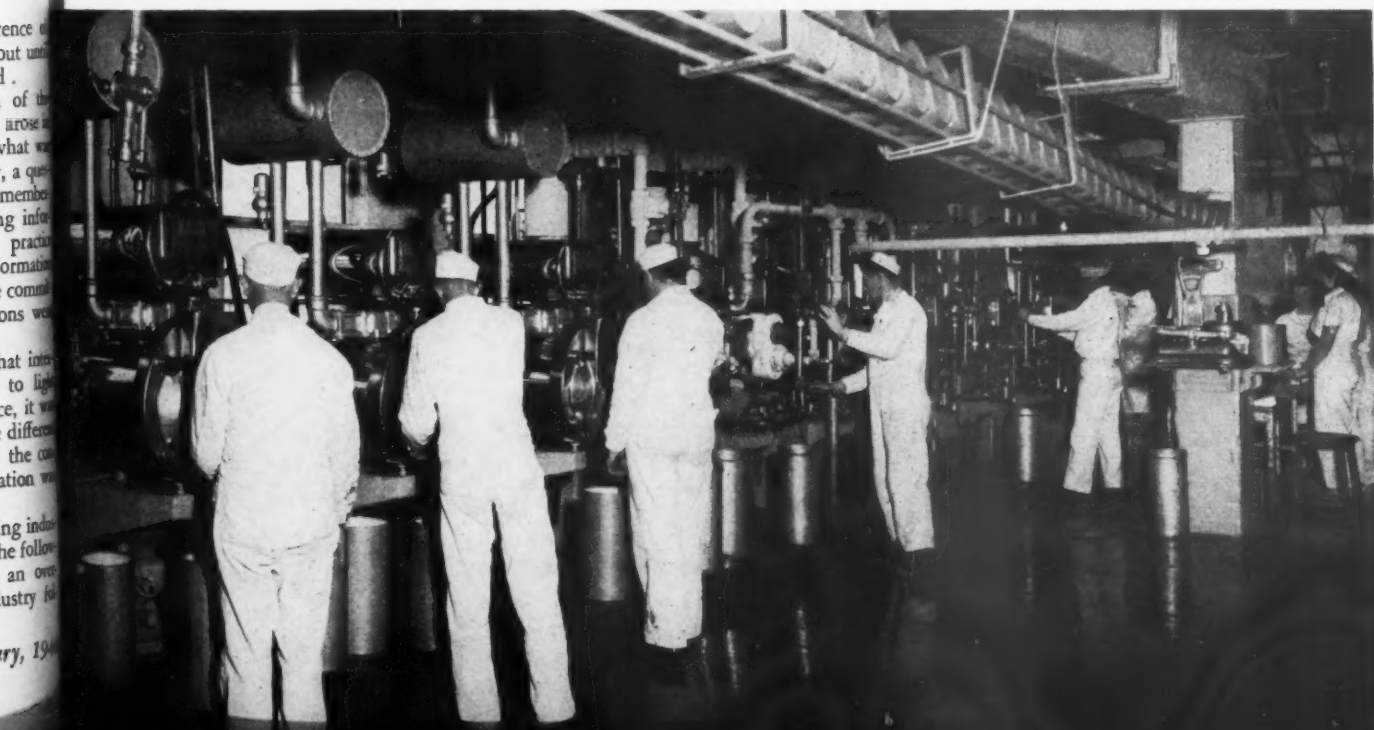
The requested meeting with the union secretaries has been held. There are 11 articles and 93 sections in our contract, and each was fully covered by a page or pages in the manual. The union secretaries made suggestions for revisions of the interpretations of seven of the 93 sections covered. Of the seven, six were non-controversial and constructive, and the union's suggestions were accepted and incorporated into the manual. One of the suggestions was controversial. No decision was reached and it may be necessary to arbitrate to determine the real intent and meaning of this clause in the contract. If so it is almost certain that it will be done in a friendly manner, just as a friendly suit is brought in court to determine the meaning of a law.

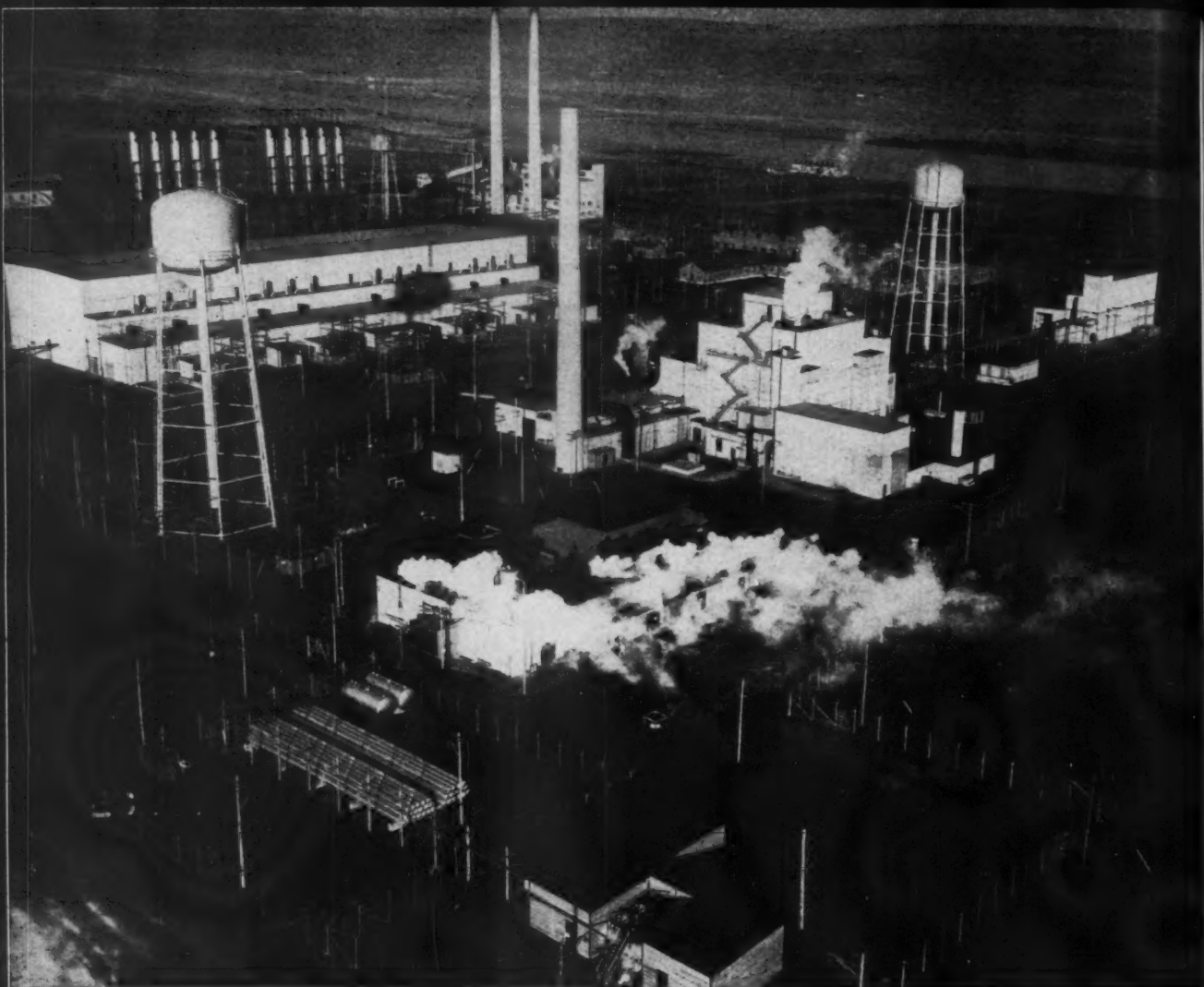
The reaction of the employers was universally favorable. One of the practical results has been that calls upon the association office for contract interpretations have lessened considerably. Personnel officers of individual companies report that calls upon them by their branches and departments have likewise diminished.

In conclusion, our industry feels that successful and harmonious relationships with the unions representing our employees depend upon clear understandings between us. We further believe that successful industry-wide bargaining depends largely upon common understanding of the contract and upon as uniform administration as it is humanly possible to obtain.

Present indications point to the fact that our manual is a distinct step forward in promoting these objectives.

* Among the various workers covered by the dairy industry agreement are these in the ice cream division of Arden Farms Co.





• Nuclear energy industry has achieved the lowest accident rate in the United States at plants like this unit of the Hanford project.

How Workers Are Protected In a Nuclear Energy Plant

By C. P. CABELL

Technical Department, General Electric Co.
Hanford Engineer Works, Richland, Wash.
(By courtesy of the General Electric Review)

(This is the second of a series of two articles)

OPERATING the new nuclear power plants will require at least in the beginning, highly skilled labor. When operation of Hanford Works was begun the men at the controls, serving as operators, were graduate engineers with several years' industrial operating experience, and they had been given a three-month intensive training course in nuclear power.

Later, as operations became more routine, these men were relieved (for more advanced positions) by the operators they had helped to train. These operators, however, were top-skilled men from chemical

plants, and most of them had had 10 years' experience in operations.

Much has been said and written about the dangers of working in nuclear power plants. But this type of work can be extremely safe under skilled supervision. As proof, consider the safety record of Hanford Works, the only place in the world where nuclear energy has been used on a large scale. The safety record there, where thousands of workers are employed, should be indicative of what can be accomplished by good management.

Safety is usually evaluated by the injury-frequency rate, which is the number of lost-time injuries per 1,000,000 man-

hours. For all American industry, in the last year for which there is an available record, 1946, the frequency rate was 14.16 injuries per 1,000,000 man-hours. In electric utilities, the rate was 14.81; in chemicals, 10.09; and in communications, 3.33. The lowest recorded figure the author has ever been able to find is 1.1, which was for industrial office employees in the State of Washington.

But where does Hanford Works stand? What is the accident frequency for this nuclear energy business? The answer is that it has the lowest accident-frequency rate recorded for any industry! The cumulative figure, through October, 1947, is

0.73 accidents per 1,000,000 man-hours, and the value during 1946 was only 0.34.

Thus, the nuclear energy industry has the lowest accident rate in the whole country—a rate just about half that for office employees, and but a quarter of that for communications, generally considered the safest industry. And, furthermore, not one single case of injury due to radiation has ever occurred in the plant.

Based on those experiences, it is certain that if the new nuclear power plants are designed and operated as well as Hanford Works there will be no problem of worker safety. However, the steps taken at Hanford to prevent accidents are admittedly most thorough.

Safety in Engineering Design

In the engineering design of the operating units, every precaution was taken to make the operation as safe as possible. The shields which protect the workers from radiation hazards are particularly important, and the successful solution of this difficult engineering-physics problem was one of the major design factors which have contributed to the remarkable safety record.

From the operating point of view, safety men say that all accidents are preventable, and that the safety record is a direct reflection of the amount of effort spent on safety. At Hanford, the policy set by top management is "operate safely," and every operating procedure is written with safety as the prime goal. To help operating supervision in the safety effort, Hanford Works has two special service groups.

These two groups are the Safety Division of the Service Department and the Medical Department. The Safety Division is charged with the primary responsibility for preventing accidents of the normal industrial type, such as falls, accidents caused by moving machinery, dangerous chemicals, poor working conditions, etc.

Operating conditions are carefully studied from this point of view, and any hazardous conditions which appear are dealt with promptly (through recommendations to operating supervisors) before they cause an accident.

Teaching Employees Safe Working Habits

Possibly the major part of the Safety Division's work, however, is to instill safe working habits into the employees. Safety engineers are great salesmen; by talks, movies, posters, and bulletins they keep up the enthusiasm of the operating and maintenance forces for working safely.

The safety engineers report to the Safety Division of the Service Department and carry out a safety program formulated by the Central Safety Council. The council is headed by a top member of supervision, appointed by the Works Manager, and is composed of departmental superintendents and other top members of the works manager's staff.

Rules, decisions and suggestions made by this council are passed down the line, in departmental, area, and shift safety

meetings. Such meetings are held by the supervisors in charge of the department, area, or shift, and attendance at a minimum of one safety meeting per month is required of every employee in the plant.

The safety program is not just a shot in the dark. It is most interesting the way safety leaders keep their fingers on the pulse of the safety consciousness of the plant by following the record of minor injuries. When minor injuries are running between 3.00 and 3.75 per 10,000 man-hours of exposure, the plant is considered to be working safely and no serious trouble need be expected.

But, if the rate climbs above 3.75, a lapse in safety consciousness is indicated, and this means that more serious accidents—sub-major or major—may be expected. So, when the rate climbs to 3.75, more pressure goes into the safety campaign and the rate is driven down again.

A minor injury is one which requires no time lost from work, except that necessary for first-aid treatment. (Every man who receives a minor injury is required to report immediately to First Aid for treatment.) A sub-major injury is one which interferes with a man's regular work temporarily, but which is not serious enough to make him lose time.

A major injury—the so-called "lost-time" injuries which are the usual means of comparing injuries, and for which Hanford has the excellent frequency rate of 0.73—include death, temporary total disability, permanent total disability, or partial disability, and occupational diseases.

Keeping a Check on Workers' Health

The Medical Department keeps a constant check on the health of the workers. First-aid stations all over the plant handle injuries and make periodic tests of all employees. These first-aid stations have saved many lost-time injuries by giving prompt medical attention, co-ordinated with swift hospital service when needed.

Another part of the Medical Department, however, is in even closer touch with the workers. This is the so-called Health Instrument Section. One or more health instrument engineers—men who understand radiation and also understand the practical operation of nuclear energy installations—are on duty during every shift in each area. Their job is to survey the areas with portable radiation-measuring devices, to detect and report potential hazards.

Those engineers are concerned with the dangers from alpha, beta, gamma, and neutron radiation. All these radiations affect tissue. Alpha rays are large charged particles. They usually present no particular problem since they can be stopped by light shielding, such as gloves.

However, if an alpha-particle emitter should get into the body it would cause trouble. For this reason, a man who has any open cuts or scratches—no matter how tiny—cannot be permitted to work with

an alpha-emitter. And, for similar reasons, workers are not allowed to smoke or eat in any areas where traces of radioactive dust might be present.

Preventing Injury From Radiation

Beta particles are fast electrons. They give up their energy chiefly on the skin. Gamma rays are similar to x-rays, except that their frequency is much higher. They have greater penetrating power. Neutrons are fast particles, but they have no electric charge. However, like gamma rays, they have great penetrating power.

Fortunately, as a result of the many years' experience with x-rays by the medical profession, it is known that so long as the amount of radiation received daily is less than the so-called "tolerance dose" the radiation will have no harmful effect on the body.

All workers in areas where radiation may be present wear small portable H.I. (Health Instrument) radiation meters, and carry photographic film in their badges. The film and the meters are carefully checked regularly by the Health Instrument Section.

To provide a safe method of doing work in an area where minor amounts of radioactivity are present, the Special Work Permit System has been set up. A worker does his job on what is known as a "permit"—a special form which must be approved by the Operating Department, the Health Instrument Section, and whatever service department is involved, such as Maintenance if the worker is a millwright. The permit is issued only after all three departments have examined the area.

The worker must wear protective clothing, must record his time in and out of the area, and must not, under any condition, stay in the area longer than the Health Instrument Section says is permissible. However, by following that section's instructions he is safe, for its engineers never allow him to receive more than half of the tolerance dose of radiation.

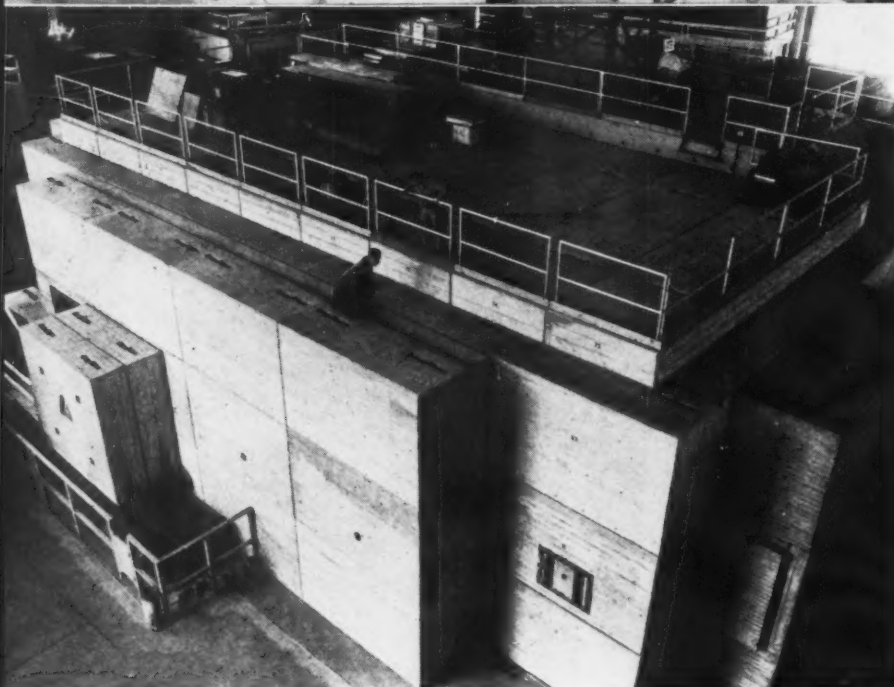
As far as radioactive material is concerned, stringent rules govern its handling and its transportation throughout the plant. In all cases, the radiation intensity is held well within tolerance limits.

Hanford Works a Tribute to Its Builder

General Electric Co. assumed responsibility for the operation of Hanford Works on September 1, 1946, at the request of Maj. Gen. Leslie R. Groves, head of the Manhattan Project of the Army Corps of Engineers. The original design and construction of this nuclear energy activity, considered by its present operator to be a great tribute to the designer and builder, and one of the greatest achievements in the history of chemical engineering, was carried out by E. I. du Pont de Nemours & Co., Inc.

The du Pont Company also operated the plant, which is spread out over a 631-

(Continued on page 44)



(Courtesy University of California Radiation Laboratory)

• Top, demonstration of the use of a "gloved hood," which prevents chemical and radioactive materials from entering the body. It is designed to eliminate all contact with the material. Below, concrete blocks are placed around the 184-inch cyclotron to shield personnel and sensitive equipment in the vicinity of the instrument from the high energy radiation given off during operation. Walls are 10 ft. thick; roof 4 ft.

square-mile area and located in the southeastern corner of the State of Washington, from the date operations were begun until General Electric assumed responsibility for its operation. The former operator had agreed to build and operate Hanford Works during the war with the understanding that it would be released from operating it as soon as possible after the war.

Final authority over this activity rests with the Atomic Energy Commission. The Manager of Hanford Directed Operations of the A.E.C. is Carleton Shugg, who, together with his staff, share the present administrative headquarters, located in Richland, Wash., with management personnel assigned there by General Electric.

The G.E. Nucleonics Project, of which H. A. Winne, G.E. vice president in charge

of engineering policy, is chairman, and members of which are Dr. Zay Jeffries, G.E. vice president and general manager of the company's Chemical Department, Dr. C. G. Suits, vice president and director of the company's Research Laboratory, and D. C. Prince, vice president in charge of the company's General Engineering and Consulting Laboratory, has been assigned responsibility for all General Electric nuclear energy activities.

Responsible Also For Knolls Laboratory

This responsibility includes not only the operation of Hanford Works but also of the \$20,000,000 atomic research laboratory, to be known as Knolls Atomic Power Laboratory, which the company is building and operating at Schenectady, N. Y., for the Atomic Energy Commission.

In a joint statement, issued during their visit earlier in 1947 to Hanford Works, vice presidents H. A. Winne and Dr. C. G. Suits said: "This country is vitally interested in determining what the potential uses of atomic energy are for application to peacetime purposes. Research and development work in this new laboratory, as well as at Hanford Works, will explore and develop the potential uses of atomic energy for peacetime purposes."

Future at Hanford Looks Promising

Since plutonium will probably be a major fuel for nuclear power plants in the future, as well as a material required for national security, its production will continue in the various Hanford Works piles.

Furthermore, the plutonium separation process is being given thorough study, and many improvements are already foreseen over the present process. A new separations unit, for improving efficiency, has been announced for future construction.

F. Ellis Johnson, formerly dean of the school of engineering at the University of Wisconsin, is chief supervisor of Education and Training, and is operating a school attended by Hanford Works people who desire to further their formal education. His faculty, now well into its second term in the new Hanford Works "School House," actually a converted dormitory, and now fitted out with library room, book storage room, and adequate classroom facilities, has been selected from those among the plant's personnel whose academic backgrounds met Dean Johnson's high standards. Courses offered are primarily those which will improve the employee's ability to carry out assigned work, as well as provide him with the increased technical knowledge he desires.

The future of Hanford Works seems better defined now than ever before. Its personnel, from scientists to stenographers, look forward to the day when they can share with engineers everywhere the thrill of seeing nuclear power come of age. And that will be the day when power is produced commercially from a nuclear energy plant.

FIXED CHARGES

	2,000 lb.	4,000 lb.	7,500 lb.	15,000 lb.
Depreciation	\$0.223	\$0.297	\$0.472	\$0.660
Interest, etc.	0.067	0.088	0.142	0.198
Total Fixed Charges.....	0.290	0.385	0.614	0.858

VARIABLE CHARGES

Repairs, including Labor.....	\$0.168	\$0.223	\$0.354	\$0.495
Fuel	0.086	0.086	0.178	0.230
Tires	0.029	0.033	0.029	0.062
Lubrication	0.008	0.008	0.009	0.018
TOTAL VARIABLE CHG.....	\$0.291	\$0.350	\$0.570	\$0.805
TOTAL COST PER HOUR.....	\$0.58	\$0.74	\$1.18	\$1.66

How Many Dollars Can A Lift Truck Save?

By BILL SCOTT

Hyster Company, Portland, Oregon

PROBABLY because materials handling is a subject of relatively recent concern to industry, few systems of cost accounting in its operation seem to have been developed. Nevertheless, it is exceedingly important because it is one of the few opportunities for cost reduction in the face of current rising prices.

Increased handling costs do not increase the value of the product but do decrease profits. Surveys show that 22 per cent of the cost and 30 per cent of the time spent in manufacturing goods is in handling materials. Reduction in these figures means increased net profits.

In an effort to establish some cost figures on the cost of owning and operating lift trucks, a survey was undertaken with a representative group of trucks of the fork-lift type operating in typical industrial application.

All trucks covered in the survey were gasoline-powered, on pneumatic tires, and had hydraulic lift and tilt mechanisms. Lifting capacities of the trucks were 2,000 lbs., 4,000 lbs., 7,500 lbs., and 15,000 lbs., all with rear-wheel steering, the largest with two rear wheels, the other three with one, trunnion-mounted steering wheel.

For standardization, an eight-hour working day was used with the trucks handling loads of an average of 80 per cent of capacity with travel distances averaging 300 feet on smooth surfaces and 200 feet over dirt roads. The only labor cost figured was that of the cost of making repairs.

The first division in cost figures was made between fixed and variable. The principal item was depreciation with interest, taxes, insurance, and storage included. Variable charges considered were repairs, fuel, tires, and lubrication.

Depreciation was based on complete write-off of the equipment over 10,000 hours operation in five years, a wide-spread standard for this type of equipment. Costs were set at the delivered price of the unit with freight figured at \$2.25 a hundred-weight, but excluding any state sales tax.

The average yearly investment was set at 10 per cent, aggregating six per cent interest, two per cent for taxes, one per

cent for insurance, and one per cent for storage and miscellaneous.

Common heavy machinery practice fixes the cost of repairs to equipment as a percentage of the depreciation. Operation records over a period of years have shown 75 per cent to be a fair allowance and accurate for practical purposes.

Fuel allowances reflect records taken over several years in a representative selection of applications of these four types of units. Price of gasoline used was 23c a gallon. Fuel consumption for the eight-hour day, for the 2,000-lb. truck was three gallons, for the 4,000-lb. truck, four gallons; 7,500-lb. truck, 6½ gallons, and eight gallons for the 15,000-lb. truck. Lubrication figures are from the same records.

Operating conditions were average enough to result in median figures on tire costs. Over a five-year period, the 2,000-lb. unit used eight sets of tires and tubes, the 4,000-lb. unit required the same, the 7,500-lb. truck needed six sets and the 15,000-lb. truck required nine sets of tires and tubes.

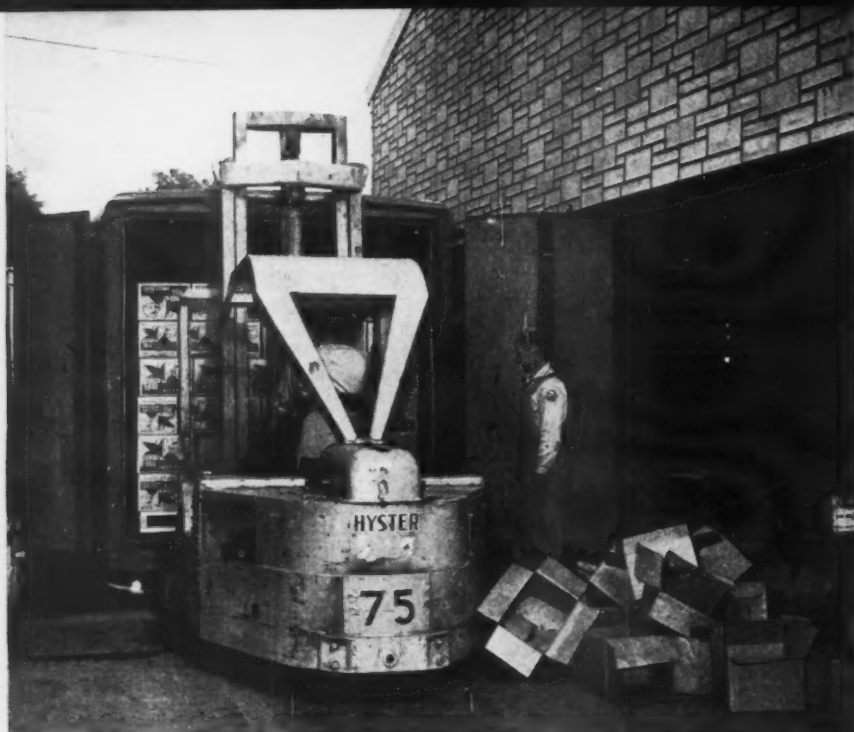
As might be predicted, hourly operating and owning costs do not increase in proportion to the lift truck capacity, the heavier units being relatively less expensive to operate. As was stressed above, the figures were taken from a comprehensive selection of applications in an effort to reflect a well rounded picture of operating costs.

(Continued on page 46)

Wherever materials are to be handled, there some business organization is either making or losing money, perhaps an amount large enough to mean the difference between profit or loss on the entire operations of the company. For that reason, "Western Industry" provides a continuous editorial service to its readers on materials handling developments and problems. The accompanying article is another of "Western Industry's" regular features on the subject of materials handling.

(Continued from page 45)

• The breakdown of the actual cost of operating a gasoline lift truck appears on the previous page. At left, a gas truck loads a Freightways truck with the finished products from Umatilla Can Co. plant at Milton, Oregon. Goods are transported from warehouse and loaded directly into truck.



Mission Completed—In 22 Minutes

INDUSTRY is starting to give helicopters a work-out, and is finding them useful in solving difficult transportation problems. In Los Angeles recently a 'copter took on what would have been an eight-hour job, and completed it in 22 minutes.

The Rocky Mountain Steel Corporation had built three giant, electrically operated crosses for the Pilgrimage Play to be held at Hollywood's Pilgrimage Bowl, and then the job loomed of moving them up a sheer sided hill 150 feet high, with no road but a narrow winding path, overhanging with dense vegetation.

Because of the steep climb and the great weight of the crosses, it was estimated that six men would have to work a full eight-hour day to carry the material to the top.

Rocky Mountain turned to a local helicopter firm for assistance. The aircraft, a Bell 47B, landed on a narrow concrete areaway at the foot of the elevation at 7:55 a.m. Twenty-two minutes and nine flights later all the equipment was safely on the summit ready for installation.

Precise maneuvering of the helicopter was necessary throughout the operation. A safe maximum load for this work is 300 pounds, though that is not the maximum capacity for a helicopter. The operation was complicated and the weight of the

load reduced because the crosses and operating mechanism had to be suspended below the helicopter in order to place it in a funnel shaped location.

Each cross weighed approximately 80 pounds and was 11 ft. 6 in. high by 6 ft. 8 in. wide. The cargo was divided into nine loads, and each was hooked to a 10-ft. cable suspended from the 'copter, to permit it to rise free before being forced to lift the load, and to hover over the unloading stage at a safe height for unfastening the equipment.

The unloading platform was only 22 ft. by 4 ft. and rested on a narrow ledge just short of the summit; and the 'copter's rotor

blades were ever in danger of slashing into overhanging bushes and jutting rocks. The same precise control was necessary at the loading area, a box canyon barely wide enough for an automobile to make a tight turn. The pilot was aided by hand signals from assistants stationed at both loading and unloading stages.

Two men were placed on the platform, and one on the side of the hill to direct the helicopter operator. Another two men were placed at the take-off spot, making a total of five men besides the operator. After an hour's preparation, and 22 minutes of actual moving time, the job was completed. The operation was so successful that G. L. LeMunyon, general manager of Rocky Mountain, says he plans to use helicopters in the future as part of his regular installation service.



• Hovering above the unloading platform, only 22x4 ft. on a narrow ledge, the helicopter is controlled with precision to avoid slashing foliage with rotor blades. Nine trips were necessary to move the load, and the operation took just 22 minutes.

JOB EVALUATION:

What It Takes to Make It Pay

By THOMAS T. ARDEN
Executive Vice-President
Grayson Controls Division
Robertshaw-Fulton Controls Company
Lynwood, California

(This is the second in a series of two articles)

JOB evaluation, as a means of achieving "equal pay for equal work," simply involves taking a job apart and comparing the pieces. It is simple, however, only when it is carried out according to a plan, and it is effective only when the plan is carried out with accuracy.

In the booklet which the California Manufacturers Association has issued explaining their plan, detailed instructions are given for applying it successfully, though they emphasize that the persons who carry out the plan be chosen with care, and perhaps assisted by a professional consultant.

When a job is "taken apart" the pieces are called factors. The CMA plan designates 12 factors, and most every job contains many or all of them. The factors are: Experience; education and training; complexity; physical demand; mental and visual demand; responsibility for material equipment and product; responsibility for records and reports; responsibility for relations with others; responsibility for confidential data; responsibility for safety of others; working conditions; and unavoidable hazards.

In brief, job evaluation compares the experience each job requires, the complexity of all jobs, the physical demand each requires, and so on through the other factors. A system of points is assigned each degree of experience, complexity, etc., required, and after all comparisons are made each job ends up with a score. Rates of pay are then assigned according to the scores. A high score would be paid a high wage, and so on down the scale.

How It Works

The mechanics of the CMA plan call for a series of forms. First, accurate descriptions of each job; second, an evaluation questionnaire for each job, on which the factors are rated individually; third, a comparison sheet, on which all jobs and their factor ratings are shown; fourth, a scatter graph, on which jobs are plotted according to point ratings and wages paid.

CMA have issued with their plan a factor summary which shows the number of points to be assigned each degree of each factor. A key is also given to each factor,

showing what each degree includes and the number of points for it.

Take factor 1, experience, for example: The first degree is "no experience required," 0 points. Second degree is three months or less, 22 points; third degree, over three months and up to and including six months, 44 points; fourth degree, over six months and up to and including one year, 66 points. Ten degrees are shown on the summary with the tenth, over eight years experience, receiving 200 points. Each factor is broken down similarly.

When filling out a job evaluation questionnaire for a job the evaluator decides which degree of each factor applies, then refers to the factor summary for the number of points to assign.

Vertical Comparison

The comparison sheet, the next step, insures consistency in rating by a vertical comparison. This helps weed out any inequities by comparing jobs factor by factor. It shows in one column, for example, the amount of experience required for each job in the shop. If the evaluator has overestimated the requirements of a certain job, it will show up on this comparison.

Among the pitfalls in evaluating jobs is a tendency to evaluate a title or the employee on the job rather than the job description. The evaluator might be unintentionally biased from his own background, or perhaps the job was described incorrectly.

The rates paid for each job are also entered on this sheet.

From the information on the comparison sheet the jobs are plotted on a scatter graph. On the horizontal scale are evaluation points, on the vertical scale the hourly

rate in terms of dollars and cents. The "line of best fit" is then drawn through the points. All jobs that do not fall within a range of plus or minus 10 per cent of this line should be analyzed to determine inequities in pay. In general, underpaid jobs should be raised to the line, overpaid jobs dropped to the line.

From this graph the rate structure may be established, comparable, of course, to the going rates in the community, and within established management policy. This comparison might result in a shift of the finally accepted evaluation curve on the scatter graph.

Wage Surveys

Throughout the nation's wartime experience of wage and salary control under the National War Labor Board, literally hundreds of wage surveys were published. They became so commonplace that many of us have grown callous toward a serious weakness that has prevailed throughout most surveys published to date.

Many trade associations, many industrial groups, and the government itself have frequently published wage surveys, based upon no better information concerning the actual jobs than a simple job title. Many wage surveys have compared the work of a typist in one industry with that of a typist in another industry, or the work of a drill press operator in one industry with a drill press operator of another industry, all without any serious attempt to disavow whether the typists or drill press operators being compared were actually doing the same kind of work.

When job titles alone are used, wage survey information frequently can be little short of dangerous. For example, we might see a survey wherein a relatively high figure appears after the title "typist." Chances are the wage might be justified on a thorough examination of the work being performed. But we might also discover that the job title has been incorrectly used. Perhaps a stenographer's or a secretary's work was actually implied.

Likewise, the drill press operator in one plant might be running a simple single spindle drill press on routine work, whereas the drill press operator in the other



plant might be running an expensive and complicated radial drill press, performing a wide variety of precision operations. Obviously, their work is not at all the same, although they might both be called "drill press operators." How much better would it be to lift the curtain before these jobs and find out what actual work is involved. Job evaluation alone will provide the answer.

Maintenance of a Program

Proper consideration of any job evaluation program must recognize the simple fact that evaluation is essentially dynamic, ever changing and *never* static. Job descriptions themselves are not static. As businesses change, the jobs within an organization will change.

It is essential that significant changes in jobs be written into existing descriptions, and that when changes occur in the work, new descriptions be made and re-evaluated. Many excellent programs have been ruined because it has been assumed that once installed, the system would "wear" forever.

Far from being an annoyance, however, the constant maintenance and vigilance essential for job evaluations are good for a business. It is just about as important for you as an employer to know when you are

under-paying for work as it is to know when you are over-paying. Both situations will give you trouble.

The C.M.A. plan counsels considering job evaluation as a continuing process, somewhat like a continual audit or "perpetual inventory" of your jobs. Both employer and employee should have the right within any plan to request the re-evaluation of any job. If handled with dispatch, requests for re-evaluation are healthy. They offer a splendid opportunity to prove the fairness of an objective approach to the establishment of proper wages.

Most companies having a working acquaintance with job evaluation recognize it as an important and essential element of their business and assign maintenance of the plan to a responsible company official. In addition to recognizing that evaluation is good and ever changing, a good plan will provide for periodic general checks, like a quarterly or semi-annual audit, to make doubly sure that the plan is being used properly and kept up to date and "on the beam."

Anyone contemplating the adoption of a job evaluation program cannot be over-cautioned on the subject of proper maintenance. A good plan improperly or inadequately maintained might conceivably be of less value than no plan at all.

Some of the Factors in Job Evaluation

FACTOR #1: EXPERIENCE

Weight—20 per cent

This factor measures the minimum length of time required by an average individual with the specified education or knowledge to learn to perform the job satisfactorily.

DEGREE

1. None.
2. 3 months or less.
3. Over 3 months and up to and including 6 months.
4. Over 6 months and up to and including 1 year.
5. Over 1 year and up to and including 2 years.
6. Over 2 years and up to and including 3 years.
7. Over 3 years and up to and including 4 years.
8. Over 4 years and up to and including 6 years.
9. Over 6 years and up to and including 8 years.
10. Over 8 years.

FACTOR #2: EDUCATION AND TRAINING

Weight—15 per cent

This factor is a measure of the minimum knowledge and background required to perform the job satisfactorily. It appraises the time usually required to gain all systematic instruction recognized as essential in the successful performance of the job. Commercial courses, Trade School courses, and recognized Apprenticeship courses which supply background knowledge for an occupation are also considered in this factor.

DEGREE

1. Little or no education necessary. Ability to comprehend simple oral instructions is typical.
2. General knowledge equivalent to a Grammar School education. Ability to

perform simple sorting and filing, keep simple production reports such as time records, and ability to use simple arithmetic is typical.

3. General knowledge equivalent to a High School education plus a short specialty course. General knowledge of micrometers, gages, slide rule, blue print reading, typing, operation of office equipment, or a similar skill is considered typical.
4. General knowledge equivalent to High School education plus two years of business or trade school training, plus a recognized 3 to 4-year apprenticeship course, or plus at least 30 accredited units of University Extension work. Knowledge of specialized fields such as Accounting, Drafting, Time Study, Production Control, Quality Control, Personnel techniques is typical. Also broad shop knowledge involving use of complicated drawings, advanced shop mathematics and manufacturing methods is considered typical.
5. General knowledge equivalent to completion of 2 years of college. Knowledge of such specialized technical subjects as Tool Design, Laboratory Control Chemistry, Industrial Nursing is considered typical.
6. General knowledge equivalent to 4 years of college. Organized and classified knowledge of a technical or professional field such as Mechanical Engineering, Industrial Engineering, Metallurgy, and Chemistry is typical.

FACTOR #3: COMPLEXITY

(Initiative, Ingenuity, Judgment)

Weight—15 per cent

This factor measures the independent action, exercise of judgment, making decisions, variety of work and amount of planning which the job requires.

DEGREE

1. Routine work fully prescribed.
2. Elementary type of job. The employee receives simple instructions and is expected to perform the job exactly as indicated without deviation.
3. Repetitive type of job. Requires exact following of instructions and procedure. A few very minor decisions may be made by the employee, if decisions follow established procedure.
4. Variable type of job. Requires occasional making of decisions, but only when definite, well established precedents are available.
5. Variable type of job. Requires the making of frequent simple decisions, and occasional decisions or action following only general procedures in the absence of clear-cut precedents.
6. Difficult and complex type of job. Requires the making of decisions where only general procedures are available.

FACTOR #4: PHYSICAL DEMAND

Weight—6 per cent

Physical Demand is the measure of the amount of strength or endurance (or both) required. This factor appraises elements such as sitting, standing, walking, climbing, pulling and bending. Both the amount exercised and the degree of continuity should be taken into account.

DEGREE

1. No physical effort. Works from a sitting position.
2. Light physical demand. Comfortable working position. Sitting at least 50 per cent of the time. Handles light weights only.
3. Repetitive physical activity with average weight objects.
4. Frequent or almost continuous work with average weight objects and occasionally (not over 20 per cent of job cycle) pushing, pulling, or lifting of medium heavy or heavy objects.
5. Continuous work with average weight objects and/or frequent (to 50 per cent of job cycle) pushing, pulling, or lifting heavy weight objects. Arduous physical work.
6. Continuous pushing, pulling or lifting of heavy weight objects. Extremely arduous physical work, or work involving very difficult working position.

Definition of Terms

Light weights up to 15 pounds.
Average weights 16 to 25 pounds.
Medium heavy weights 26 to 50 pounds.
Heavy weights over 50 pounds.

FACTOR #5: MENTAL AND VISUAL DEMAND

Weight—6 per cent

Mental and Visual Demand is the measure or degree of mental application or eye strain required in performing the work. It measures the amount and continuity of mental or visual alertness required. Evaluation should be solely on the basis of the intensity of this demand rather than the complexity of the problem involved. On highly repetitive jobs, mental demand is reduced to a minimum because of the habit cycle formed.

DEGREE

1. Routine, simple job requiring no mental effort and no mental or visual alertness.
2. Routine repetitive job requiring slight amount of mental or visual alertness and effort. Work is not fatiguing to the eyes.
3. Repetitive job requiring frequent, but not more than normal mental or visual effort or alertness.

4. Non-repetitive and somewhat diversified job requiring continuous mental alertness or effort or close visual attention.
5. Diversified and complex job requiring continuous and sustained mental effort and alertness or very close work requiring constant visual attention.
6. High diversified and complex job requiring exceptionally concentrated and exacting mental effort and alertness or extremely close work with intense and concentrated visual attention.

FACTOR #6: RESPONSIBILITY FOR MATERIAL, EQUIPMENT AND PRODUCT

Weight—6 per cent

This factor appraises the responsibility that goes with the job of preventing damage to the tools, equipment, material and product of the company. Determine the approximate dollar value of any single mishap and the degree of care required to prevent such mishap. Also consider the cost of salvage and repair.

DEGREE OF CARE	EXTENT OF DAMAGE (Normal damage that may result at one time.)			
	A up to and including \$100	B \$100 to \$500	C \$500 to \$1000	D over \$1000
1. Damage not likely to occur. Only periodic attention required.	0	5	10	15
2. Damage fairly easy to avoid. Ordinary attention required.	15	20	25	30
3. Damage somewhat difficult to avoid. Close attention required.	30	35	40	45
4. Damage difficult to avoid. Extreme care required.	45	50	55	60

FACTOR #7: RESPONSIBILITY FOR RECORDS & REPORTS

Weight—4 per cent

This factor appraises the responsibility required by the job for accuracy in the development and maintenance of reliable records and reports of varying types, excluding individual production and time records. Consider here the degree of care required to prevent inaccuracies and the degree of loss or disruptive effect which would result from these inaccuracies.

DEGREE

1. No responsibility for records and reports.
2. Responsibility for preparation and maintenance of only a few simple records or reports where errors, if made, can readily be detected and corrected subsequently without disruptive effect.
3. Responsibility for preparation and maintenance of several simple records or reports where errors, if made, would result in minor confusion, delay, or monetary loss.
4. Responsibility for preparation or maintenance of a variety of records and reports upon which others base operating decision, but where ordinary care and checking in preparation of the data will prevent error.
5. Responsibility for preparation or maintenance of a variety of involved records or reports not subject to checking by others, and where errors would result in monetary loss or embarrassment to the company.

FACTOR #8: RESPONSIBILITY FOR CONFIDENTIAL DATA

Weight—4 per cent

This factor appraises the integrity and discretion required by the job for safeguarding confidential information handled, and the disruptive effect of disclosure upon the Company's operation and relationship. In rating the job consider the character of

the data and the degree to which the full import of the data is apparent on the job in question.

DEGREE

1. No confidential data involved.
2. Occasionally works with or has access to confidential data, but the full import is not apparent and the effect of a disclosure would be negligible.
3. Regularly works with or has access to some confidential data, which if disclosed might have an adverse internal effect.
4. Works with or has access to confidential data, the disclosure of which would be disruptive and would result in a minor financial loss to the company.

FACTOR #9: RESPONSIBILITY FOR RELATIONS WITH OTHERS

Weight—6 per cent

This factor appraises the responsibility that goes with the job for meeting, working and/or dealing with, instructing, guiding and/or influencing other persons, either within or outside the organization.

DEGREE

1. No responsibility for working with others. Few or no personal contacts made.
2. Works with and/or guides the activities of employees engaged in simple clerical or manual duties, or makes routine contacts of a simple, repetitive nature, within the company or among the general public.
3. Instructs and/or guides employees engaged in clerical or manual duties of semi-skilled nature, or makes contacts requiring some tact to avoid friction.
4. Instructs and/or advises employees engaged in the same occupations requiring approximately 2 to 4 years experience, and/or making contacts on matters requiring explanations, decisions, or the obtaining of approval, requiring a moderate degree of tact.
5. Instructs and/or advises employees engaged in various occupations requiring the equivalent of journeyman skill, and/or makes contacts on matters re-

quiring ability to deal with and influence persons in all types of positions, requiring a high degree of tact.

FACTOR #10: RESPONSIBILITY FOR SAFETY OF OTHERS

Weight—4 per cent

Consider the degree of care required by the nature of the job and the surroundings in which it is performed to avoid or prevent injuries to other persons. Only the direct acts or negligence of the person performing the job should be considered. It is assumed that other workers are observing the safety rules, and that all safety devices for which the job is not directly responsible are in order.

DEGREE

1. Little care required to prevent injury to others. Works in area or on machine where others are seldom exposed to hazards of the job. Performs work exposing one other person such as helper, where likelihood and probable seriousness of accident is small.
2. Ordinary care and attention required to prevent injury to others. Co-ordinated gang or crew work where individual acts may injure others. Operate equipment where others are occasionally exposed.
3. Considerable care and attention required to prevent injury to others. Operate power-driven mobile equipment where others are exposed but probability of accident is low.
4. A sustained high degree of attention and care required to prevent injury to others. Operate power-driven mobile equipment in congested areas. Responsible for flow of electric power or steam or the operation of high pressure vessels where others are exposed to accidents. Control units or equipment handling or processing molten or explosive materials where other persons are exposed.
5. Extreme care and judgment required to prevent injury to others. Handle, control, or transport highly inflammable, explosive or molten material exposing other persons to serious injury

FACTOR SUMMARY

SHOWING FACTORS, DEGREES, AND CORRESPONDING POINT VALUES

FACTOR	First Degree	Second Degree	Third Degree	Fourth Degree	Fifth Degree	Sixth Degree
*1. Experience	0	22	44	66	88	110
2. Education and Training....	0	30	60	90	120	150
3. Complexity	0	30	60	90	120	150
4. Physical Demand	0	12	24	36	48	60
5. Mental & Visual Demand	0	12	24	36	48	60
6. Responsibility for	(a) 0	15	30	45	.....	.....
Material, Equipment	(b) 5	20	35	50	.....	.....
and Product	(c) 10	25	40	55	.....	.....
	(d) 15	30	45	60	.....	.....
7. Responsibility for						
Records and Reports.....	0	10	20	30	40	.....
8. Responsibility for						
Confidential Data	0	10	20	30	40	.....
9. Responsibility for						
Relations with Others.....	0	15	30	45	60	.....
10. Responsibility for						
Safety of Others.....	0	10	20	30	40	.....
11. Working Conditions	0	18	36	54	72	90
12. Unavoidable Hazards.....	0	13	26	39	52	.....

*Not shown here for lack of space are the seventh degree of experience, 132 points; eighth, 154; ninth, 176; and tenth, 200.

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under-paying for work as it is to know when you are over-paying. Both situations will give you trouble.

The C.M.A. plan counsels considering job evaluation as a continuing process, somewhat like a continual audit or "perpetual inventory" of your jobs. Both employer and employee should have the right within any plan to request the re-evaluation of any job. If handled with dispatch, requests for re-evaluation are healthy. They offer a splendid opportunity to prove the fairness of an objective approach to the establishment of proper wages.

Most companies having a working acquaintance with job evaluation recognize it as an important and essential element of their business and assign maintenance of the plan to a responsible company official. In addition to recognizing that evaluation is good and ever changing, a good plan will provide for periodic general checks, like a quarterly or semi-annual audit, to make doubly sure that the plan is being used properly and kept up to date and "on the beam."

Anyone contemplating the adoption of a job evaluation program cannot be over-cautioned on the subject of proper maintenance. A good plan improperly or inadequately maintained might conceivably be of less value than no plan at all.

Some of the Factors in Job Evaluation

FACTOR #1: EXPERIENCE

Weight—20 per cent

This factor measures the minimum length of time required by an average individual with the specified education or knowledge to learn to perform the job satisfactorily.

DEGREE

1. None.
2. 3 months or less.
3. Over 3 months and up to and including 6 months.
4. Over 6 months and up to and including 1 year.
5. Over 1 year and up to and including 2 years.
6. Over 2 years and up to and including 3 years.
7. Over 3 years and up to and including 4 years.
8. Over 4 years and up to and including 6 years.
9. Over 6 years and up to and including 8 years.
10. Over 8 years.

FACTOR #2: EDUCATION AND TRAINING

Weight—15 per cent

This factor is a measure of the minimum knowledge and background required to perform the job satisfactorily. It appraises the time usually required to gain all systematic instruction recognized as essential in the successful performance of the job. Commercial courses, Trade School courses, and recognized Apprentice courses which supply background knowledge for an occupation are also considered in this factor.

DEGREE

1. Little or no education necessary. Ability to comprehend simple oral instructions is typical.
2. General knowledge equivalent to a Grammar School education. Ability to

perform simple sorting and filing, keep simple production reports such as time records, and ability to use simple arithmetic is typical.

3. General knowledge equivalent to a High School education plus a short specialty course. General knowledge of micrometers, gages, slide rule, blue print reading, typing, operation of office equipment, or a similar skill is considered typical.
4. General knowledge equivalent to High School education plus two years of business or trade school training, plus a recognized 3 to 4-year apprentice course, or plus at least 30 accredited units of University Extension work. Knowledge of specialized fields such as Accounting, Drafting, Time Study, Production Control, Quality Control, Personnel techniques is typical. Also broad shop knowledge involving use of complicated drawings, advanced shop mathematics and manufacturing methods is considered typical.
5. General knowledge equivalent to completion of 2 years of college. Knowledge of such specialized technical subjects as Tool Design, Laboratory Control Chemistry, Industrial Nursing is considered typical.
6. General knowledge equivalent to 4 years of college. Organized and classified knowledge of a technical or professional field such as Mechanical Engineering, Industrial Engineering, Metallurgy, and Chemistry is typical.

FACTOR #3: COMPLEXITY

(Initiative, Ingenuity, Judgment)

Weight—15 per cent

This factor measures the independent action, exercise of judgment, making decisions, variety of work and amount of planning which the job requires.

DEGREE

1. Routine work fully prescribed.
2. Elementary type of job. The employee receives simple instructions and is expected to perform the job exactly as indicated without deviation.
3. Repetitive type of job. Requires exact following of instructions and procedure. A few very minor decisions may be made by the employee, if decisions follow established procedure.
4. Variable type of job. Requires occasional making of decisions, but only when definite, well established precedents are available.
5. Variable type of job. Requires the making of frequent simple decisions, and occasional decisions or action following only general procedures in the absence of clear-cut precedents.
6. Difficult and complex type of job. Requires the making of decisions where only general procedures are available.

FACTOR #4: PHYSICAL DEMAND

Weight—6 per cent

Physical Demand is the measure of the amount of strength or endurance (or both) required. This factor appraises elements such as sitting, standing, walking, climbing, pulling and bending. Both the amount exercised and the degree of continuity should be taken into account.

DEGREE

1. No physical effort. Works from a sitting position.
2. Light physical demand. Comfortable working position. Sitting at least 50 per cent of the time. Handles light weights only.
3. Repetitive physical activity with average weight objects.
4. Frequent or almost continuous work with average weight objects and occasionally (not over 20 per cent of job cycle) pushing, pulling, or lifting of medium heavy or heavy objects.
5. Continuous work with average weight objects and/or frequent (to 50 per cent of job cycle) pushing, pulling, or lifting heavy weight objects. Arduous physical work.
6. Continuous pushing, pulling or lifting of heavy weight objects. Extremely arduous physical work, or work involving very difficult working position.

Definition of Terms

Light weights up to 15 pounds.
Average weights 16 to 25 pounds.
Medium heavy weights 26 to 50 pounds.
Heavy weights over 50 pounds.

FACTOR #5: MENTAL AND VISUAL DEMAND

Weight—6 per cent

Mental and Visual Demand is the measure or degree of mental application or eye strain required in performing the work. It measures the amount and continuity of mental or visual alertness required. Evaluation should be solely on the basis of the intensity of this demand rather than the complexity of the problem involved. On highly repetitive jobs, mental demand is reduced to a minimum because of the habit cycle formed.

DEGREE

1. Routine, simple job requiring no mental effort and no mental or visual alertness.
2. Routine repetitive job requiring slight amount of mental or visual alertness and effort. Work is not fatiguing to the eyes.
3. Repetitive job requiring frequent, but not more than normal mental or visual effort or alertness.

4. Non-repetitive and somewhat diversified job requiring continuous mental alertness or effort or close visual attention.
5. Diversified and complex job requiring continuous and sustained mental effort and alertness or very close work requiring constant visual attention.
6. High diversified and complex job requiring exceptionally concentrated and exacting mental effort and alertness or extremely close work with intense and concentrated visual attention.

FACTOR #6: RESPONSIBILITY FOR MATERIAL, EQUIPMENT AND PRODUCT

Weight—6 per cent

This factor appraises the responsibility that goes with the job of preventing damage to the tools, equipment, material and product of the company. Determine the approximate dollar value of any single mishap and the degree of care required to prevent such mishap. Also consider the cost of salvage and repair.

DEGREE OF CARE	EXTENT OF DAMAGE (Normal damage that may result at one time.)			
	A up to and including \$100	B \$500	C \$1000	D over \$1000
1. Damage not likely to occur. Only periodic attention required.	0	5	10	15
2. Damage fairly easy to avoid. Ordinary attention required.	15	20	25	30
3. Damage somewhat difficult to avoid. Close attention required.	30	35	40	45
4. Damage difficult to avoid. Extreme care required.	45	50	55	60

FACTOR #7: RESPONSIBILITY FOR RECORDS & REPORTS

Weight—4 per cent

This factor appraises the responsibility required by the job for accuracy in the development and maintenance of reliable records and reports of varying types, excluding individual production and time records. Consider here the degree of care required to prevent inaccuracies and the degree of loss or disruptive effect which would result from these inaccuracies.

DEGREE

1. No responsibility for records and reports.
2. Responsibility for preparation and maintenance of only a few simple records or reports where errors, if made, can readily be detected and corrected subsequently without disruptive effect.
3. Responsibility for preparation and maintenance of several simple records or reports where errors, if made, would result in minor confusion, delay, or monetary loss.
4. Responsibility for preparation or maintenance of a variety of records and reports upon which others base operating decision, but where ordinary care and checking in preparation of the data will prevent error.
5. Responsibility for preparation or maintenance of a variety of involved records or reports not subject to checking by others, and where errors would result in monetary loss or embarrassment to the company.

FACTOR #8: RESPONSIBILITY FOR CONFIDENTIAL DATA

Weight—4 per cent

This factor appraises the integrity and discretion required by the job for safeguarding confidential information handled, and the disruptive effect of disclosure upon the Company's operation and relationship. In rating the job consider the character of

the data and the degree to which the full import of the data is apparent on the job in question.

DEGREE

1. No confidential data involved.
2. Occasionally works with or has access to confidential data, but the full import is not apparent and the effect of a disclosure would be negligible.
3. Regularly works with or has access to some confidential data, which if disclosed might have an adverse internal effect.
4. Works with or has access to confidential data, the disclosure of which would be disruptive and would result in a minor financial loss to the company.

FACTOR #9: RESPONSIBILITY FOR RELATIONS WITH OTHERS

Weight—6 per cent

This factor appraises the responsibility that goes with the job for meeting, working and/or dealing with, instructing, guiding and/or influencing other persons, either within or outside the organization.

DEGREE

1. No responsibility for working with others. Few or no personal contacts made.
2. Works with and/or guides the activities of employees engaged in simple clerical or manual duties, or makes routine contacts of a simple, repetitive nature, within the company or among the general public.
3. Instructs and/or guides employees engaged in clerical or manual duties of semi-skilled nature, or makes contacts requiring some tact to avoid friction.
4. Instructs and/or advises employees engaged in the same occupations requiring approximately 2 to 4 years experience, and/or making contacts on matters requiring explanations, decisions, or the obtaining of approval, requiring a moderate degree of tact.
5. Instructs and/or advises employees engaged in various occupations requiring the equivalent of journeyman skill, and/or makes contacts on matters re-

quiring ability to deal with and influence persons in all types of positions, requiring a high degree of tact.

FACTOR #10: RESPONSIBILITY FOR SAFETY OF OTHERS

Weight—4 per cent

Consider the degree of care required by the nature of the job and the surroundings in which it is performed to avoid or prevent injuries to other persons. Only the direct acts or negligence of the person performing the job should be considered. It is assumed that other workers are observing the safety rules, and that all safety devices for which the job is not directly responsible are in order.

DEGREE

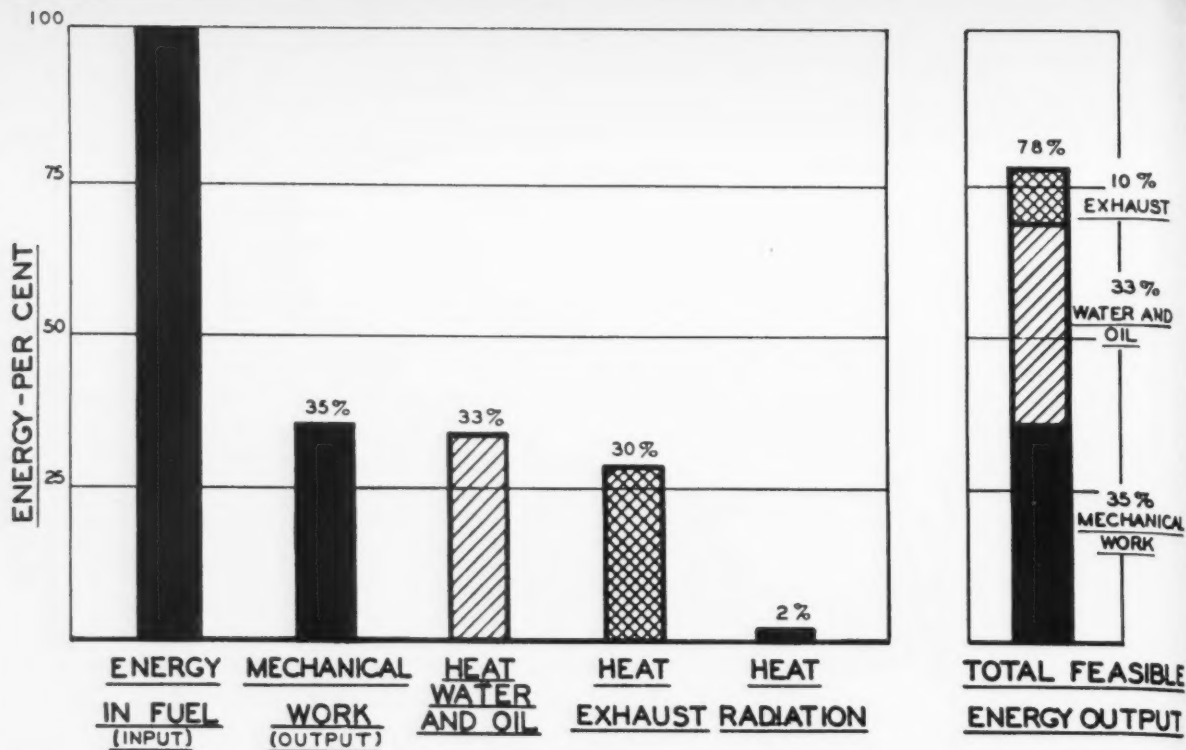
1. Little care required to prevent injury to others. Works in area or on machine where others are seldom exposed to hazards of the job. Performs work exposing one other person such as helper, where likelihood and probable seriousness of accident is small.
2. Ordinary care and attention required to prevent injury to others. Co-ordinated gang or crew work where individual acts may injure others. Operate equipment where others are occasionally exposed.
3. Considerable care and attention required to prevent injury to others. Operate power-driven mobile equipment where others are exposed but probability of accident is low.
4. A sustained high degree of attention and care required to prevent injury to others. Operate power-driven mobile equipment in congested areas. Responsible for flow of electric power or steam or the operation of high pressure vessels where others are exposed to accidents. Control units or equipment handling or processing molten or explosive materials where other persons are exposed.
5. Extreme care and judgment required to prevent injury to others. Handle, control, or transport highly inflammable, explosive or molten material exposing other persons to serious injury

FACTOR SUMMARY

SHOWING FACTORS, DEGREES, AND CORRESPONDING POINT VALUES

FACTOR	First Degree	Second Degree	Third Degree	Fourth Degree	Fifth Degree	Sixth Degree
*1. Experience	0	22	44	66	88	110
2. Education and Training.....	0	30	60	90	120	150
3. Complexity	0	30	60	90	120	150
4. Physical Demand	0	12	24	36	48	60
5. Mental & Visual Demand	0	12	24	36	48	60
6. Responsibility for Material, Equipment and Product	(a) 0 (b) 5 (c) 10 (d) 15	15 20 25 30	30 35 40 45	45 50 55 60	....................	....................
7. Responsibility for Records and Reports.....	0	10	20	30	40	.....
8. Responsibility for Confidential Data	0	10	20	30	40	.....
9. Responsibility for Relations with Others.....	0	15	30	45	60	.....
10. Responsibility for Safety of Others.....	0	10	20	30	40	.....
11. Working Conditions	0	18	36	54	72	90
12. Unavoidable Hazards.....	0	13	26	39	52	.....

*Not shown here for lack of space are the seventh degree of experience, 132 points; eighth, 154; ninth, 176; and tenth, 200.



* For increased efficiency, heat energy now wasted can be used. Chart shows the distribution of energy in a typical diesel engine.

WHAT'S AHEAD FOR DIESELS

- ... Increased average combustion pressures
- ... Greater utilization of waste heat
- ... Closer collaboration with gas turbines

By SAUL BELILOVE

Engine Division
Enterprise Engine & Foundry Company
San Francisco

FUTURE diesel developments can be looked for along these lines. The first is increased loading, which is merely increased average combustion pressure, to be obtained from higher supercharging pressures, improved bearings, and materials and design of greater heat resistance.

A second trend to be expected is greater emphasis on utilization of waste heat, both of exhaust and cooling systems. Thirdly, we can expect to find even closer collaboration of the diesel and the gas turbine, since they are logically suited for joint use.

Recent major trends can be summarized as follows:

(1) Higher revolutions per minute and greater piston speeds for the same uses than in times past, with greater reliability and less maintenance, although the peak

operating speed of about 2,000 rpm has not changed in the last ten years.

(2) A huge increase in production and therefore a large decrease in relative first cost.

(3) Design developments which account for what is probably the greatest gain in the last decade, namely, in loading increases. There is also considerable evidence to indicate that this field will also bear the major burden of development in the immediate future.

Along the line of maintenance, the most influential factor has been the improvement in calibre of diesel maintenance men. Due mostly to training during the war, we have begun to approach the point where our diesel maintenance men are adequate to the task.

As to design, further improvement in thermal efficiency beyond the 40 per cent which can now be achieved is not to be expected. New methods, however, resulting from new basic ideas, can give improved utilization of our fuels.

An example is to view the diesel engine as producing heat energy as well as mechanical energy. By weighing the entire needs of the power plant, we may learn how to provide a balanced overall arrangement which utilizes what is now considered waste as an integral by-product of the energy output.

Thus, even though the thermal efficiency of the engine itself may not be greater than 35 to 40 per cent, it is still possible that the heat rejected to the jacket water and to the exhaust gases may be useful

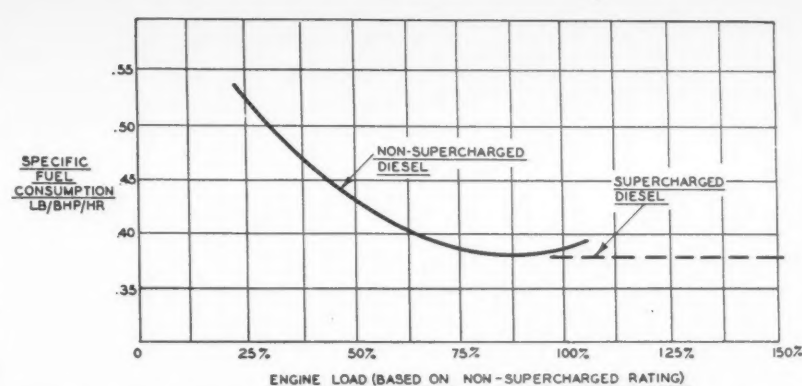
either for space heating or to operate low pressure boilers for process steam or other purposes. The overall utilization of the energy within this fuel can be as high as 75 per cent in some plants. Obviously the relatively low temperatures in these systems thus available are not particularly valuable to obtain mechanical work since we must go through another inefficient thermal conversion.

High temperature cooling, somewhat radical in previous diesel thought, is now an accepted fact. With the "vapor phase" idea, extremely high temperatures, as high as 230° and perhaps 250° F. are used. In many cases this does not require any change in the engine; occasionally minor modification is entailed.

Increased loading is obtained by burning more fuel in the cylinder per cycle of operation. Supercharging, the mixing of a greater supply of oxygen with the fuel by injecting air under pressure, has permitted increase in brake mean effective pressure to approximately 120 p.s.i. in four-cycle engines, a gain of approximately 50 per cent. For two-cycle engines, continuous mean effective pressures of over 80 p.s.i. are being utilized, compared with the 60-70 p.s.i. of the past. By using the exhaust heat (Buchi system) in the 4-cycle engine to effect supercharging, the energy cost of driving the super-charger is eliminated.

There is considerable evidence that considerably higher loadings for four-cycle engines can be obtained in the near future, perhaps as much as 20-25 per cent additional. Indeed, for one application where peak power is required only intermittently, one engine manufacturer rates his engine at 150 p.s.i. BMEP.

A further new development includes even higher supercharging pressures than used under the Buchi system, running as high as 15 p.s.i., where under the Buchi



• This chart shows typical diesel engine variation of specific fuel consumption with load. Increased engine loading has improved thermal efficiency over unsupercharged engines.

system the pressures are rarely more than 6 p.s.i. Unfortunately two problems result, namely, a large increase in peak pressures and heat dissipation. Consequently the maximum continuous loading is not appreciably above the Buchi system, although higher peak loadings for a short time are obtainable.

With supercharged engines substantially complete combustion is being achieved, and increasing the heat resistance of engines is now the greatest problem. Development of specially treated cleaning oils has provided one answer. Oil cooled pistons, chrome plating of cylinder liners or piston rings, and the use of aircraft-type alloy exhaust valves have helped.

Some interesting suggestions have been made regarding decreasing the heat load. Calculations show clearly that the intake air temperature is a major factor in the average gas temperature of the cycle. Even with the conventional Buchi system, the use of a simple cooler will decrease intake air temperature sufficiently to allow load-

ings to increase appreciably, perhaps as much as 20 to 30 per cent in addition to the standard increase of the Buchi system.

Thus the total increase in loadings over a non-supercharged engine can be as much as approximately 75 per cent. Moreover, for high pressure supercharging, the heat generated in compressing the intake air in the supercharger becomes even greater than in the Buchi system, and the use of an inter-cooler is even more desirable.

It is interesting to note that aircraft gasoline engines in many cases have used two-stage superchargers, with inter-cooling after each stage. However, the purpose of such intercooling was more to eliminate detonation than to decrease heat load within the engine, although this was a factor. But in the diesel, supercharging does not encourage knocking but rather discourages it; thus inter-cooling in the diesel is used for the primary purpose of removing the heat burden from the engine parts.

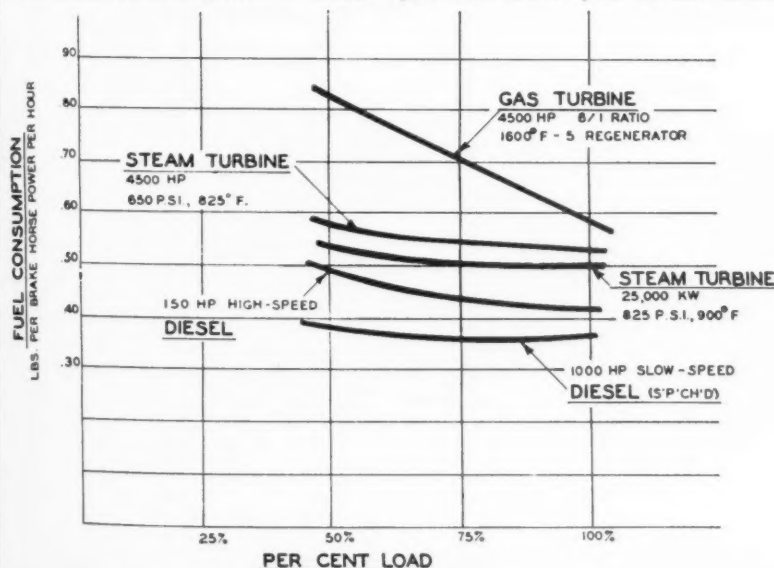
Recently cooling the air inside the engine itself was suggested, simply by cutting off the intake air supply while the piston is moving downward on its intake stroke. With this system, the engine is equipped with a high pressure exhaust driven supercharger, delivering about 15 pounds per square inch pressure.

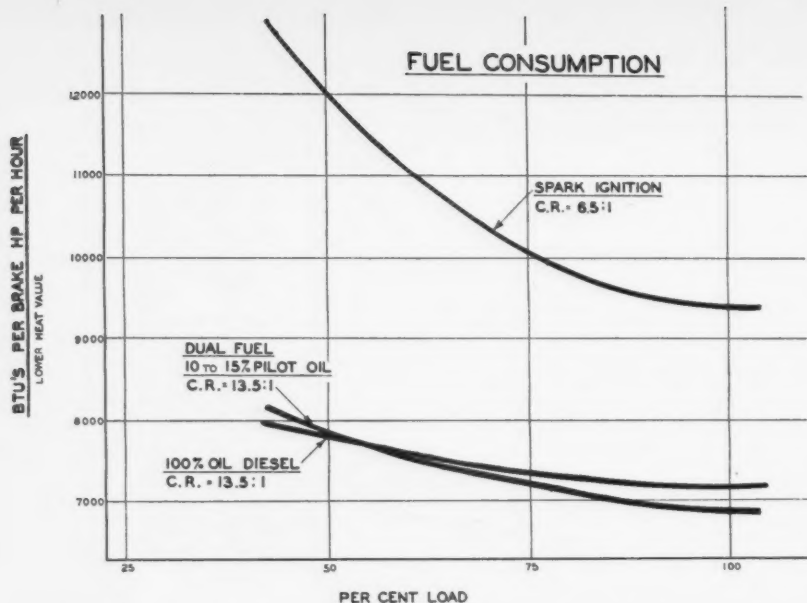
The air enters the engine at this pressure, but since it is cut off before the full downward stroke of the piston is completed, the remaining portion of the intake stroke expands this high pressure air to approximately 5-6 p.s.i., similar to the pressure used with the Buchi system. During this expansion the air is cooled so that actually the same effect is achieved as the use of an inter-cooler.

Use of this method depends strictly on the heat limitations in the diesel engines, since otherwise it would be absurd to decrease high pressure after having gone to the trouble of generating it. Nevertheless, the suggestion points a very keen arrow at the major problem of diesel engine improvement, namely, that of how to generate more heat in the combustion chamber without adversely affecting the operating parts.

(Continued on page 52)

• Fuel consumption comparison of various engines shows diesel by far the most efficient.





• The combination gas-oil engine gives enormous savings where natural gas is plentiful.

Another suggestion for improvement, a combination diesel and gas turbine, has been reported in actual tests conducted in Germany and Switzerland. It makes use of the theoretical advantages and disadvantages of the reciprocating and turbine type prime movers.

In the reciprocating engine the peak temperature occurs for only a small fraction of the operating cycle when the piston is at its innermost position. As a result, high efficiencies can be and are attained, and the heat load on the materials is relatively low.

Many of the working parts of the steam or gas turbine are subjected to the peak operating temperatures continuously during the cycle. As a result, peak temperatures are strictly limited, although the possible exhaust temperatures are considerably lower than those obtainable with the reciprocating type engine, because of the limited expansion ratio of the latter.

In effect, the reciprocating engine skims off the top peak temperatures while the turbine utilizes the lower temperature, higher quantity gas products. With a combination system both the diesel and the turbine can be geared to the output, working shaft, or the diesel might be used purely as a compressor and feeder or high temperature gas to the turbine, with the turbine putting forth all of the mechanical work.

Suggestions even have been made for the diesel to operate without a crank shaft, using an air cushion to return the piston, or for a design of the double acting type with alternate firings on either side returning to the pistons. It appears that arrangements of this kind, because they more greatly utilize the heat available in the exhaust gases, can offer thermal efficiencies between 40 and 50 per cent.

Diesel power has supplanted other types of prime movers in many fields because of its inherent high efficiency, resulting in great economy, improvements in design and materials that have permitted lighter weight and cheaper first cost and maintenance. Only mental inertia has kept the steam engine in use in some operations today, although of course in certain areas the lesser cost of coal offsets the greater efficiency of the diesel.

COMPARATIVE FUEL COSTS Northern California (October 1947)		
Fuel	Based on	Cost for 1,000,000 BTU's
Standard Diesel Oil	8.2c/Gallon	58c
Bituminous Coal	\$13.00/Ton	54c
Bunker Diesel Oil	\$2.85/BB	47.5c
Standard Fuel Oil (light)	\$1.80/BB	29c
Natural Gas	30c/1000 ft. ³	27c
Bituminous Coal (near source)	\$5.00/Ton	21c
Natural Gas (near source)	10c/1000 ft. ³	9c

Use of low grade oil is also possible in diesels, bringing about still further fuel economy. However, there is a line of diminishing return, as maintenance costs rise with the use of the cheaper fuels. The possibility of an ultimate scarcity of oil having an adverse effect has been put off indefinitely by improvements in oil technology. Two promising developments are the economical production of oil from common shale and coal.

A significant example of advanced thinking in the diesel industry is the combination gas-oil engine, in which natural gas can be burned on the diesel cycle, attaining the full efficiency of this cycle, while using only a small amount of oil, 10 per cent or less, for pilot ignition. Although spark ignition engines always have been capable of burning natural gas, the immediate conversion features, enabling the engine to be operated on oil, gas or almost any mixture of the two fuels with-

out interchange of parts and loss of time has come only with the combination engine. Controls are so arranged that change over from gas to oil operation is automatic without disturbing the load.

This development has become extremely popular in the last year throughout the Middle West, where natural gas from Midcontinent oil fields is available, and in engines used in the oil fields themselves. Moreover, it will be of considerable value in sewage disposal plants where sewage gas is available, cost free, for burning in internal combustion engines and producing power for pumping, blowing, and other station uses. Where natural gas is cheaply available, this can be an enormous saving, when it is considered that fuel accounts for perhaps 75 per cent of direct operating costs. Another important advantage is reliability, since if the gas supply should fail, oil is automatically added to take up the load. Advantage can thus be taken of surplus gas rates when available.

Compression Ratio

Another interesting development from improvement of fuels is that the compression ratio for the gasoline engine has been steadily upward, and we can foresee a point where the compression ratios of both gasoline and diesel engines will compare closely. At the same time the weight of diesel engines has been steadily downward. Thus we may soon find the two different only in the method of ignition and the type of fuel used, not in compression ratio, which has been the traditional distinction.

Choice of prime mover for a given field depends upon requirements for weight, space, initial cost, maintenance cost, etc. Over ten diesel locomotives are being ordered to one steam engine, because of superior fuel economy, cleanliness and dependability. Saving in fuel cost and lugging ability have put the diesel in the lead in the large bus and trucking field. For marine use, it is fully accepted everywhere up to 5,000 h.p. and probably will go higher.

In stationary installations, diesel is almost exclusively used up to 2,500 h.p., and probably will reach an ultimate use up to 10,000 h.p., because of its high efficiency irrespective of size. It can be sold and installed almost as a package unit because it is small and compact. It eliminates the need to transmit electric power over long distances, an expensive process.

In the aviation field the most likely challenger, if any, is the combination diesel engine and exhaust turbine. There is little danger of competition with atomic power, because the latter appears feasible now only in sizes of 100,000 KW and over. The gas turbine may find use in standby plants of 5,000 to 10,000 KW because of simplicity and low cost, although its relatively low efficiency compared with the diesel makes its use in continuous service doubtful.

NEW PRODUCTION TECHNIQUES

Inspection By Block and Tackle

THE only way to tackle a 57-foot-high tail is with a block and tackle, according to engineers at Consolidated Vultee Aircraft Corporation, who were faced with the problem of providing inspection access to the fin on the Air Force's giant XC-99 transport.

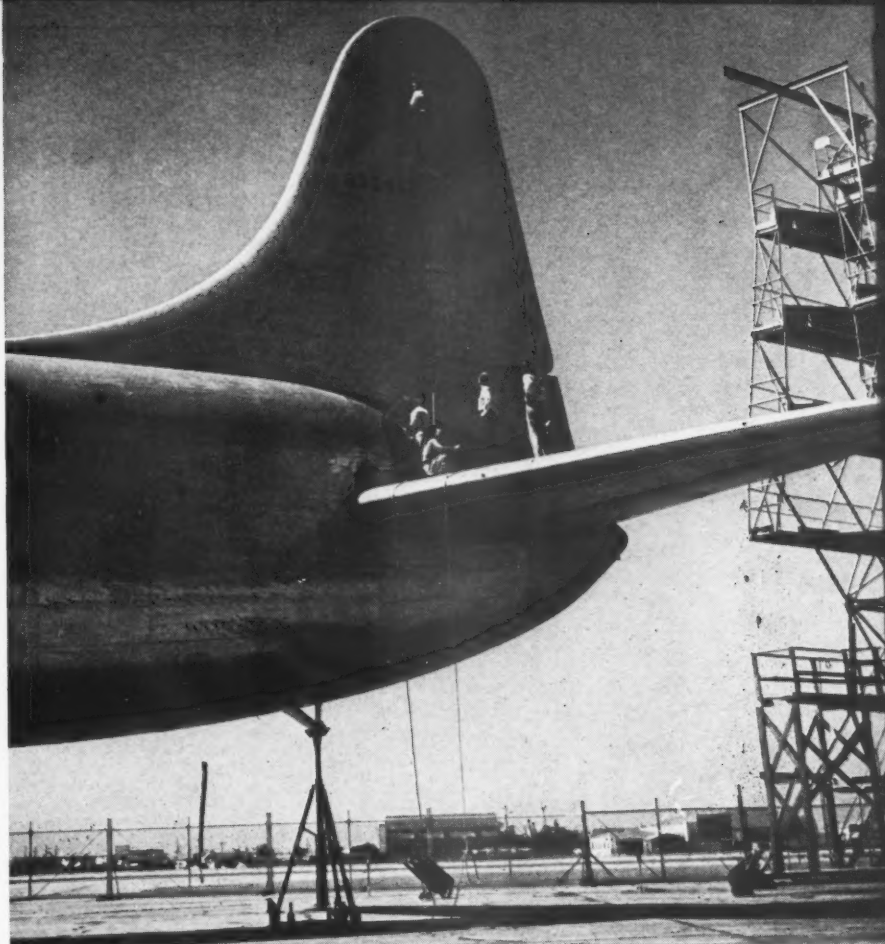
Recently test flown for the first time at San Diego, the six-engine, double-decked XC-99 is the world's largest land plane, capable of hauling 400 soldiers or 100,000 pounds of cargo.

Knowing that no hydraulic stand could be elevated 57 feet and that a tail stand of sufficient size would not be available at many airfields, a couple of engineers at Convair rigged up a boatswain's chair on the end of a block and tackle. Then they hoisted the block into place by means of a pulley, which was built into the fin for this purpose.

A self-propelled inspector was then able to look over the XC-99's tail surfaces in jig time. This manhour-saving device is to be a permanent part of inspection and maintenance procedures on the experimental USAF plane.

Here's how the tackle is pulled through the pulley in the first place. A light cable stretches from the pulley to an attaching point inside the fuselage. A lead weight, recessed into the outer surface of the fin, is attached to the cable. Would-be inspectors tie the cable to a light line inside the fuselage and release the cable from its attaching point. The lead weight pulls the cable over the pulley down to the stabilizer, where the inspectors attach the block and tackle. They then haul the cable, with block and tackle tied to it, back into the fin and anchor it.

A specially built stand was used by employees who worked on the XC-99's tail surfaces during final assembly of the plane.



• Inspector propels himself over tail surface. Stand at right was used during assembly.

New Method of Barking Logs

A NEW method of barking logs has been developed which leaves the log free from bark without cutting into the outer sapwood. Conventional barking methods remove an average of five per cent of the wood along with the bark.

Weyerhaeuser Timber Company, who developed the new equipment, are now using it at their plywood plant at Longview, Washington.

The new equipment removes bark by compression and shearing action. One man operates the machine from a carriage which moves the bark-removing compression head across the log, which turns in a giant lathe. Controls mounted upon the carriage guide a rotating wheel which compresses and shears off the bark. An air cylinder and piston furnish the power for the compression head, which automatically follows the log's contours.

The new barker was conceived and carried through several stages by the engineers of the development department making practical application of the simple principle that less force is required to crush bark than to crush green wood. When the

force is right, the bark separates automatically where desired at the cambium layer thus securing wood-free green bark as one product and bark-free logs as the other, and cheaply without expensive equipment. The Weyerhaeuser engineering department assisted in the final designing of the barker which was built by the Globe Machinery Company, Tacoma, Washington.

Clean bark removed by the machine furnishes raw material for Silvacon, new bark products used as ingredients in plastic, insecticides, magnesite flooring, rubber compounds and many other products. A part of the Silvacon plant's output returns to the plywood plant for use as a glue extender.

Average barking time for an eight-foot log of 40-inch diameter is 1 3/4 minutes, about the same as with conventional equipment. The compression cylinder and shearing head may be mounted upon standard Rosser barkers now in use.

Application has been made for patents on the barker and plans are being developed to permit its use by other timber producers.

One of the best-informed writers at the Nation's Capital, Arnold Kruckman, presents each month authoritative comments on political developments and their practical application to industry of the West. Any reader who wishes additional information may write to him directly, using business letterhead, at 1120 Vermont Avenue, N.W., Washington, D.C. Inquiries will be answered free of charge. You also are invited to contact him personally in Washington. Copies of pending congressional bills may also be obtained free of charge.

How Marshall Plan Would Affect West

California prunes, Northwest apples probably will not be included in temporary relief program

WASHINGTON, D.C.—The prospects that may come with the operation of the Marshall Plan for the dried prunes of California, and the dried apples of the Pacific Northwest, may be deducted from the present operation of the temporary European Relief Program.

The Credit Commodity Corporation of the Department of Agriculture buys the food supplies for the European account, either on requisition of the Army, or State Department, or on its own authority.

Under the law as it now stands, the CCC may defray losses in making purchases up to a total of \$50,000,000 gross. It acquires required foodstuffs at the market price in the United States, and sells the purchase to the Europeans at the price prevailing in Europe or on the basis of exchange.

As the purchase of dried fruit is handled today, it works something like this: suppose prunes or apples are sold at 9c per pound, and the European can pay only 4c. In that case CCC buys them at 9c, sells them to Europe for 4c and absorbs the loss by using some of the funds in the \$50,000,000 supporting fund.

There are, for instance, 120,000 tons of raisins which will be purchased by the CCC on this basis because it has committed itself to support the raisin market. It will make other deals in a similar manner. Most of the dried fruits now on the list for distribution in Europe are surpluses which have accumulated in the East. There seems no likelihood that many Western products will figure extensively in the temporary European Relief Program.

The chances for your dried prunes and dried apples should come with the establishment of the operation of the Marshall Plan, which is still on the lap of the gods in Congress and final crystallization depends to a substantial degree on what the members of Congress learned about the

sentiment of the people back home when they were away from Washington for the holidays.

We know, at this writing, that the law passed during the special session has created a new agency of Government which is the equivalent of the old War Production Board. When they discuss it here they tell you the purpose of the new control agency will be to direct group business action in the program of "voluntary" allocations, inventories, wages, prices, and other restrictions.

The theory is that this new system will be entirely free of coercion, or pressure; that every businessman and industrialist, of his own impulse, will submit to the plan of allocations and so forth. It takes a very great stretch of the imagination, and most complete naivete, to suppose that any program, backed even by the shadow of a Federal law, will be voluntary in essence, and operation, no matter how nicely it may be wrapped up in slick tinsel.

Make up your mind that any WPB or its equivalent that comes into existence at this time will have the power of the tremendous influence and pressure of the federal government prestige back of it, and that it will not be healthy to oppose this authority, even if its action is indirect and negative. It was recently pointed out that this government effort, whether it works or fails, for good or ill, may result in profound changes in business practices.

This correspondent has consistently maintained that the Marshall Plan means more controls; controls probably even more drastic in the end than the original WPB. Your correspondent is willing to go out on that well-known limb and predict now that the present WPB is the opening phase of the control system which will be administered by the Army as soon as the emergency seems to justify its absorption by the military.

There are many persons in Washington who are not New Dealish or Fascist, and who are nothing but good old-fashioned believers in the original type of American democracy, individualism, capitalism, free enterprise, and personal liberty, who feel that tremendous changes are ahead in our system of government, our socio-economy, and our ideology, if we acquire many more new agencies such as this WPB. The tendency towards more controls, more centralization, more close harmony with the military, is becoming more obvious day by day.

Great events, like great phenomena of nature, always produce a pre-condition which is like the lull before the storm. You get that feeling when you circulate here among the different groups which represent the sharply different ideologies. There seems little doubt that the pending Presidential campaign will smoke some of this undercurrent into the open.

It is interesting to note that 225 Congressmen visited Europe last summer. They have various ideas and have reached different conclusions, but they all agree that Europe's chief trouble is not due to the physical devastation. They say it stems mainly from deterioration of the traditional mechanisms of social cooperation and government. They tell us the Europeans fell into the habit of sabotage, during the war, and they find it hard to break it. Left-wing leaders grabbed the rich booty when the Germans moved out, and now possess the great wealth which they use to finance communistic activities in the countries which are the centers of disturbance.

The Congressmen report Communism is the best-organized social philosophy in Europe and has the best system of finance. They report France has \$4,000,000,000 in gold well hidden, which will not come out until things are stabilized. The British have more money than they know what to

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aluminum toys that are light but rugged... aluminum sports equipment that lasts for years



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One of the best-informed writers at the Nation's Capital, Arnold Kruckman, presents each month authoritative comments on political developments and their practical application to industry of the West. Any reader who wishes additional information may write to him directly, using business letterhead, at 1120 Vermont Avenue, N.W., Washington, D.C. Inquiries will be answered free of charge. You also are invited to contact him personally in Washington. Copies of pending congressional bills may also be obtained free of charge.

How Marshall Plan Would Affect West

California prunes, Northwest apples probably will not be included in temporary relief program

WASHINGTON, D.C.—The prospects that may come with the operation of the Marshall Plan for the dried prunes of California, and the dried apples of the Pacific Northwest, may be deducted from the present operation of the temporary European Relief Program.

The Credit Commodity Corporation of the Department of Agriculture buys the food supplies for the European account, either on requisition of the Army, or State Department, or on its own authority.

Under the law as it now stands, the CCC may defray losses in making purchases up to a total of \$50,000,000 gross. It acquires required foodstuffs at the market price in the United States, and sells the purchase to the Europeans at the price prevailing in Europe or on the basis of exchange.

As the purchase of dried fruit is handled today, it works something like this: suppose prunes or apples are sold at 9¢ per pound, and the European can pay only 4¢. In that case CCC buys them at 9¢, sells them to Europe for 4¢ and absorbs the loss by using some of the funds in the \$50,000,000 supporting fund.

There are, for instance, 120,000 tons of raisins which will be purchased by the CCC on this basis because it has committed itself to support the raisin market. It will make other deals in a similar manner. Most of the dried fruits now on the list for distribution in Europe are surpluses which have accumulated in the East. There seems no likelihood that many Western products will figure extensively in the temporary European Relief Program.

The chances for your dried prunes and dried apples should come with the establishment of the operation of the Marshall Plan, which is still on the lap of the gods in Congress and final crystallization depends to a substantial degree on what the members of Congress learned about the

sentiment of the people back home when they were away from Washington for the holidays.

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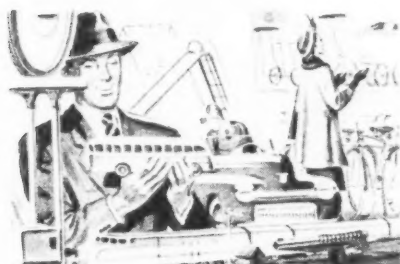
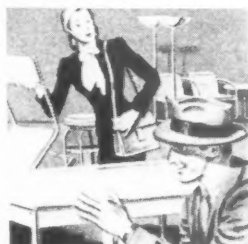
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Detroit • Boston • Buffalo • New York City • Philadelphia • Washington, D. C.

(Continued from page 54)

do with, because there is little they can buy. The Dutch are reported to be in a bad way because both their Indonesian and German markets are shot. Poland has a surplus of food for which Russia has no need, and Poland needs manufactured goods which Russia cannot supply.

Most observers tell us the aid we give to Europe is a pure gamble, but we must take it in order to head off an infectious chaos. The aid is to be divided into three categories: capital goods, which Congressmen think should be financed by the International Bank; raw materials and agricultural machinery, which is to be financed by the Export-Import Bank; food, fuel,

and fertilizer, which most of Congress thinks must be supplied virtually free, if the advances in the other two categories are to be repaid.

The Congressmen who visited Europe say we should not give anything for nothing, particularly if the governments of the countries which benefit handle the donations. It is urged that local foreign currencies, all of which are shaky, should be placed in the hands of reputable trustees, headed by an American to avoid perpetuation of an unhealthy fiscal situation, and to make local resources pay for local expenditures for the use of labor, sand, stone, etc., for rehabilitation.

There is almost unanimous urgency that no dollars be given Europeans to buy food, fuel, fertilizer; they urge we buy the actual commodities and send them to Europe.

There seems little doubt that large numbers of food processing, farm and mining machinery will go to Europe. We are told here that most of the manufacturers anticipate the urge to supply Europe will be so great that our own needs will inevitably suffer. Already the people of the industries which use the above-named types of equipment are either here, or are working, through their representatives, to check the outpour of the equipment.

The wheat people came up with a more or less novel idea. Incidentally, wheat is not regarded as a real problem, according to the authorities. They say the needed 450,000,000 bushels for Europe either has already been assembled and purchased, or the procurement has been arranged. The grain cooperatives themselves do not foresee any unusual problem in supplying the necessary volume, but they are bothered about the rapidly diminishing supply of useful farm machinery. This led to the proposition which this correspondent regards as novel.

Two men from the Pacific Coast appeared here shortly before the holidays, representing approximately 40 per cent of all grain growers of the United States. They were empowered to sell the Government for European relief 150,000,000 bushels of wheat at a moderate price. But the proposal carried the conditions that the Federal government must assemble iron scrap in Europe and elsewhere and deliver to the grain cooperatives a substantial part of the 50,000,000 tons reported scattered around the world, which the farmers offered to buy at current prices.

The cooperatives propose to turn the scrap over to the steel mills, who would be expected to supply the resulting ingots and shapes and sheets to the manufacturers of farm machinery. They in turn would channel it to the interested farmers, as well as others in this country, but with a strict prohibition against sending any of the machinery abroad for any purpose whatever. The Congress people rather like the idea, but the CCC people do not like it at all.

Sweden's trade agreement with Russia thus far has revealed only a deal on grain from the Soviets. But it is suspected in Washington that the type of fruits produced on the Pacific Coast which Sweden has hitherto imported is included. The Soviets are expected to attempt to channel the fruit from their Balkan satellites into Sweden. The trade agreement has been kept well under wraps, and details are yet unknown.

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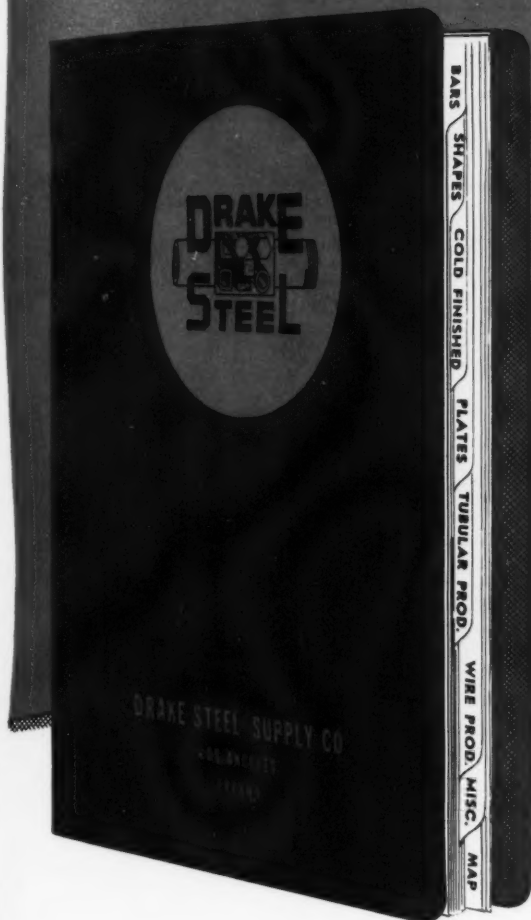
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WESTERNERS AT WORK...

Arizona

Reid Gardner, Phoenix, named pres. of Arizona Edison Co., and Douglas B. McGregor, exec. v. pres.

D. J. Pope, formerly manager of the Southwestern Mining Division of American Smelting and Refining Co., Tucson, appointed gen. mgr. of Western Mining Dept. of same company, hdqts. in Salt Lake City, Utah. A. E. Ring succeeds Mr. Pope as mgr. of Southwestern div.

California

Oil

R. G. Follis, pres. Standard Oil Co. of Calif., advanced to newly created position of vice-chairman of the board. T. S. Petersen, v. pres. and director, promoted to pres. of firm.

Clarence S. Beesemyer and Philip S. Magruder elected v.p.'s of Gen. Petroleum Corp.



R. L. Minkler

R. L. Minkler succeeds S. J. Dickey (retired) as pres. of Gen. Petroleum Corp.; was recently elected a member of National Industrial Conference Board, and chosen as one of three Western oil men appointed by Secty. of Interior Krug to Gov.'s 15-man Military Petroleum Advisory Committee.

Manufacturing

L. S. Curfew upped to exec. v. pres.; Joseph F. Lee, gen. mgr., and George F. Denny, chief engineer of Vapor Recovery Systems Co., Los Angeles.

Carl R. Olson chosen v. pres. of Permanente Cement Co., Standard Gypsum Co. of Calif., Permanente Steamship Corp., and Glacier Sand & Gravel Co.

A. S. Adcock, supt. San Pablo works of American Radiator & Standard Sanitary Corp., named mgr., replacing W. W. Craeger, transferred to Torrance as works mgr.

A. E. Acker, former works manager for General Tire Company's plumbing division plant at Pasadena, now with Pryor Mfg. Co., Pasadena.

D. S. Grubbs tagged for sec.-treas. job of Adel Precision Products Corp., Burbank and Hollydale, Calif., and Huntington, W. Va.

Chemicals

Harry R. Lange elected v. pres. in charge of finance and accounting for Cutter Laboratories, Berkeley.

Industrial Service

Alexander von Hafften, mgr., agricultural and legislative depts. of San Francisco Chamber of Commerce, upped to post of mgr. of chamber's Washington, D. C., office.

Transportation

G. P. Torburn chosen gen. supt. of car dept., with hdqtrs. in San Francisco of Pacific Fruit Express.

Walter Reese succeeds Albert W. Hayes as v. pres. in charge of Western departments of Railway Express Agcy. Latter retires after 47 years of continuous service.

Food

Changes in Rosenberg Bros. set-up since purchase of world's largest dried fruit packing concern by Consolidated Grocers Corp. interest in-

clude: Arthur C. Oppenheimer moves up from president to chairman, Nathan Cummings (heading up the new ownership group) becomes president; Arthur C. Oppenheimer II, executive vice-president. Dwight Grady and Ferdinand Ehrenfeld continue as vice-presidents, as do other officers.

Annon Grice, re-elected pres. of Blue Lake Packers, Inc., food processing cooperative. Chester Mueckey, McMinnville, vice-pres.; A. F. Lamb, Salem, re-elected sec.-treas.

Shipping

Vincent P. McMurdo named Pacific Coast mgr. of Luckenbach Line succeeding the late Harry C. Ewing.

Research

Newest member of Stanford Research Institute is Dr. Ronald Scantlebury, former physiologist and pharmacologist on the University of Arkansas Medical School faculty. Dr. Scantlebury will engage in physiological research in connection with smog.

Metals

Alwyn A. Throckmorton chosen mgr. of scrap procurement for Kaiser Aluminum div. of Permanente Metals Corp. Former deputy director of War Assets Administration, metals div., and reg. dir. WAA's region two in New York. Oakland will be hdqtrs. of new job.

Federated Metals Div., American Smelting & Refining Co., announces following promotions: Louis D. Alpert, ass't to Pacific Coast gen. mgr.; John Selfridge, Jr., supt. of San Francisco plant; and Robt. C. Caldwell, ass't supt. of San Francisco plant.

Steel



W. A. Harrington

Emmett M. Goodbar appointed division supt. maintenance at Pittsburg plant of Columbia Steel.

Oil Supplies

W. A. Miller elected secretary and treas. of Lane-Wells Co., succeeding Miss B. G. Peters, retired.

Awards

Special annual award of the Society for the Advancement of Management presented to Dr. Vernon D. Keeler, management consultant and lecturer in bus. admin. for U.C.L.A. Extension.

Colorado

Edward A. West appointed exec. v. pres. of Denver & Rio Grande Western railroad. Alfred E. Perlman, former chief engineer, moves up into Mr. West's former job of gen. mgr.

Idaho

C. J. Edwards, factory supt. of Utah-Idaho Sugar Co., of Blackfoot, selected as mgr. of company's South Dakota district with headquarters at Belle Fourche. Wm. L. Crabbe, factory supt. at Belle Fourche, will be in charge of the Blackfoot plant until end of current processing season. Mr. Edwards was formerly ass't gen. supt. of the company at Salt Lake City, Utah.

Montana

E. S. McGlone, v. pres. of Anaconda Copper Mining Co., elected chairman of the Western division of the American Mining Congress, succeeding H. M. Lavender, v. pres. of Phelps Dodge Corp.

Robert C. Preuss, former mine supt. for U.S. Vanadium Corp. in Peru, is now chief engineer for Sidney Mining Co., Kellogg, Idaho.

F. A. Linforth, ass't to mgr. of mines of Anaconda Copper Mining Co., upped to ass't v.p. of company.

Paul R. Trigg elected exec. v.p. of Montana Flour Mills Co. Other officers are: Charles R. McClave, pres.; Chas. G. McClave, treas.; W. N. Smith and Al Stroehn, v.p.'s, and Rodney J. Anderson, sec.

Chesley Brazel, formerly with the Bonneville power administration, has joined the upper Missouri district reclamation staff in Great Falls, as district power mgr.

Ford T. Scalley named Montana mgr. for Utah-Idaho Sugar Co. He is son of D. A. Scalley of Salt Lake City, v. pres. and gen. mgr. of sugar company.

Oregon

Rolland Jory (United Growers, Salem, Oregon) elected pres. Northwest Frozen Food Association.

P. F. Sandstedt elected pres. of Pan-L-Hon Corp. of Portland. R. O. Baer named v.p. and mechanical engineer, and Marie E. Vengelen, sec.-treas.

P. L. Fowler, Fowler Mfg. Co., and M. J. Frey, Oregonian Publishing Co., both of Portland, named to board of directors of Columbia Empire Industries, Inc.

Utah

John F. Maloney has been named traffic manager for Geneva Steel. He was formerly assistant traffic manager.



George R. TenEyck



John F. Maloney

George R. TenEyck announced as purchasing agent of Geneva Steel Co., U. S. Steel subsidiary. Mr. TenEyck has been acting purchasing agent.

Lester K. Scholl, promoted to mill foreman in charge of personnel operating crushing and flotation plants for U.S. Smelting, Refining & Mining Co., Midvale, Utah. Mr. Scholl was formerly ass't plant engineer.

A. N. Hopkins appointed gen. mgr. of new Salt Lake operation of Chicago Bridge & Iron Co.'s fabricating plant to be constructed at once.

S. J. Craighead, Uniontown, Pa., assumed duties as v. pres. and gen. mgr. of U. S. Fuel Co., Salt Lake City. He succeeds Paul L. Shields, newly appointed pres. of Sheridan-Wyoming Coal Co.

Richard S. Bennett, v. pres. and gen. mgr. of Bennett's, elected Western regional v. pres. of National Paint, Lacquer & Varnish Ass'n, with jurisdiction over Utah, Colorado, California, Oregon and Washington. . . . Wallace F. Bennett, pres. and gen. mgr. of Bennett's, chosen regional vice-chairman for several Western states of the National Association of Manufacturers. M. Gadsby, Utah Power & Light Co., takes over Mr. Bennett's former position as Utah director for NAM.

F. V. Hicks, supt. of Geneva Steel Co.'s coal mine in Horse Canyon, Utah, appointed gen. supt. of mines.

Washington

F. L. Thompson, mgr. of Roaring River Logging Co., installed as pres. of Pacific Logging Congress at 38th annual session in Seattle. Other officers elected are: Robt. F. Dwyer, Portland, v. pres., and L. H. Mills, Portland, treasurer.

Ralph G. Deede, associate regional director of WAA, Seattle area, promoted to director of Intermountain region, comprising Utah and parts of Nevada and Idaho.

Lawrence Wylie, division supt. Milwaukee Road, Tacoma, named electrical engineer, Lines West, hdqts. in Seattle, succeeding Rienier Beukes, retired. A. O. Thor, ass't supt., took over Wylie's former post in Tacoma.

Thomas J. Skewes, Jr., chief marine chemist with Lauck's Laboratories, Inc., now associated with Alexander Gow, Inc., Seattle, marine survey firm.

Owen W. Hurd, new mgr. of Benton county P.U.D. power distribution system, succeeding J. B. Whitehead, who resigned to devote full time to job as mgr. of Benton Rural Electric association. Mr. Hurd formerly employed as ass't mgr. and district engineer for the Bonville power administration at Spokane.

Clyde W. Summerville, exec. v.p. and gen. mgr. Seattle Steel Co., elected president to succeed William Pigott, deceased.

Boeing Aircraft, Seattle, appoints David A. Mowrer, chief service engineer, as head of all engineering service activities for company. . . . Robt. L. Regan is Seattle gen. factory supt.

Paul G. Hahn named district mgr. of Spokane area for Lehigh Portland Cement Co., succeeding W. G. Perrow, retired.

Williams S. Lucey, v. pres. in charge of plant operations for Rayonier, Inc., elected exec. v. pres. He is also a director and member of executive committee.

Dave Watson named v. pres. and mgr. of Lynch Lumber Co., Longview.

Wyoming

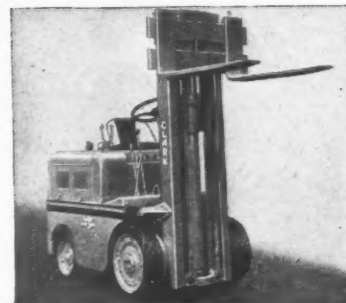
Paul L. Shields replacing D. H. Pape, retired, as pres. of Sheridan-Wyoming Coal Col. Mr. Shields was former v. pres. U.S. Fuel Co. of Salt Lake City, Utah.

(Continued on page 60)

MATERIAL HANDLING News

TIERING HEIGHT 130" COLLAPSED HEIGHT 83" FREE LIFT 62"

That "free lift 62 inches" is the vital specification of HI-LO-STACK, Clark's new high-lift, low-clearance attachment. It means that the forks can be raised 62 inches from the floor before there is any increase in the overall height of the machine.



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Also HI-LO-STACK is an exceedingly simple mechanism. It has only one lift cylinder, and a single set of uprights with slide members inside. Lifting is accomplished with unusually low hydraulic pressure, which minimizes possibility of leakage.

It adds up that HI-LO-STACK is a typical Clark development—sturdily built, simple as can be, a thoroughly dependable unit; a good example of the sound engineering and incomparably rich knowledge of handling operations for which Industry looks to Clark. Write for particulars.

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Associations Elect

Stuart H. Ingram chosen as chairman of American Institute of Mining and Metallurgical Engineers, southern California section. Dr. Ian Campbell of Caltech elected vice-chairman for mining. W. H. Geis, treas., and L. W. Vhadteen, sec.

A. J. Glasow, Bend, Oregon, elected pres. of National Lumber Manufacturers Association at 45th annual meet in Chicago. Mr. Glasow is a member of board of directors of Western Pine Association, former chairman of trade promotion committees of Western Pine and NLMA, and former pres. of American Forest Products Industries, Inc.

Gordon Lefebvre, pres. of Cooper-Bessemer Corp., elected new pres. of Diesel Engine Mfg. Ass'n at annual meeting in Chicago. Otto H. Fischer, pres. of Union Diesel Engine Co., Oakland, and L. W. Metzger, v.p. of Baldwin Locomotive Works, elected v.p.'s of D.E.M.A.

Philip E. Hodel, Portland, pres. of Huntington Rubber Mills, elected pres. of Columbia Empire Industries, Inc. Other new officers are: H. H. Pein, Portland, pres. and gen. mgr. of Pein Box Co., first v. pres.; Albert E. Epperly, v. pres. of R. Veal & Son, Albany, and Vern Johnson, Pacific Coast mgr. of Evans Products Co., Coos Bay, second vice presidents.

William M. Hale, exec. v. pres. American Trust Co., named chairman of Bay Area Council (San Francisco); Charles P. Howard, pres. Howard Terminal, Oakland, vice-chairman and chairman of exec. committee; Frank E. Marsh, exec. v. pres. and gen. mgr.; D. Porter Dunlap, v. pres. Bank of America, treas.; Warren Burke, district traffic mgr., United Air Lines, San Francisco, secty.

E. P. Larson of the Celotex Corp. elected pres. of Northern California Chapt. of Producers' Council, Inc., at meet of manufacturers

of bldg. materials and equipment, in San Francisco. New v. pres. is J. A. Carlson, Kraft Co., Niles, Calif.; secty. is D. W. Lyon of Libbey-Owens-Ford Glass Co.; treas., W. J. Rawlings of Harbor Plywood Corp. of Calif.

The Pacific Logging Congress installed F. L. Thompson of Scio, Oregon, as pres. at session in Seattle. Other officers included Robert E. Dwyer of Portland, v.p.; Archie Whisman of Portland, re-elected secty.; L. H. Mills, Portland, treas., and Charles P. Kein, Kalispell, Montana, bus. mgr.

Philip W. Bailey of West Coast Stained Shingle Co., Seattle, elected pres. of newly formed National Ass'n. of Stained Shingle and Processed Shake Manufacturers. H. W. Newman, Colonial Cedar Co., Seattle, chosen secty. treas. Permanent hdqts. for new ass'n will be in Seattle and an executive secty. will be chosen on a full-time basis.

Marshall Ramstad, incoming industrial engineer for the Tacoma Chamber of Commerce, elected vice-chairman of Washington-Oregon section of Institute of Chemical Engineering at convention in Seattle. Dr. Wells Moulton, professor chemical engineering at U. of Washington, elected chairman and John Stephen of Seattle, secty.-treas.

Robt. A. Cooper, Pacific Palisades, new Calif. mgr. of Calif. Mfg. Ass'n. Mr. Cooper resigned as v.p., Plastic Die and Tool Co., Los Angeles, to accept Ass'n job.

The Pacific Marine Fishery commission, created by the legislatures of three Pacific Coast states, have elected the following officers: John Veatch, Portland, chairman; Richard Croker, San Francisco, vice-chairman; Milo Moore, Olympia, secty., and H. F. Linse, Portland, treas. Mr. Moore is director of the Washington state dept. of fisheries.

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REGIONAL REVIEWS

TEHACHEPI TO TIJUANA

Economy Still Trying to Overtake Population Growth

Employment remains high, but Southland still cannot begin to house its newcomers. Hollywood gets area's only serious slump.

LOS ANGELES — Last year's mighty efforts to massage away some of this area's economic cramps have brought visible evidences of relief—but the patient still is feeling a bit stiff and musclebound.

Particularly is this true in the housing field, where frantic building has failed to keep pace with the continued influx of Easterners, bent on settling here before there is a place for them to live. Although Los Angeles rolled up the astonishing total of a quarter-billion dollars' worth of building permits in 1947, giving it an entirely disproportionate share of the nation's construction activity, 1948 finds the housing shortage worse than a year ago. Small wonder, since the county's population grew by an estimated 204,574 when a year's normal growth would have been about 40,000.

With departure of the summer's transient visitors, the record-breaking stream of west-bound newcomers to southern California began in late fall to dip to levels actually below last year's rate. It is yet too early to know whether or not this slackening portends any important change in the sustained western movement.

Not, of course, that local business men weren't grateful for the \$467,000,000 left behind them by the 3,000,000 tourists who visited southern California in 1947—they were, for tourism is still an important industry here. There is a reflection of today's expensive living, however, in the fact that though the number of visiting tourists was 5.4 per cent greater than in the previous year, their spendings fell 8.4 per cent.

At the turn of the year, industrial construction was slackening after rolling up a total approaching \$125,000,000 in new plant investment during 1947. That growth is topped only by two records—that for the war peak year of 1945, and by the first postwar year of 1946. It represents roughly the same amount of industrial de-

velopment as took place here from 1936 through 1940, according to Los Angeles Chamber of Commerce tally.

Despite shrinkages in its aircraft industry, San Diego, which for a brief period just after V-J Day was the sick man of this area, has revived vigorously and its Major Knox recently termed its housing shortage "more critical than during the war." Rear-Admiral Oscar C. Badger, 11th Naval District Commandant, reports that 6,000 Navy families in the area have inadequate housing, for which reason further expansion in Navy personnel has been discouraged and several Pacific Fleet vessels shifted to other bases. The Commandant conferred recently in the east with representatives of two large insurance companies, who signified their interest in possibilities for investment in permanent housing construction here.

Employment Picture Brightens

The employment picture continues to look brighter than was generally expected. Automobile and auto parts makers have increased their employment since fall by about 12 per cent, despite material shortages which continue to hold down production. Although retailers hired extra help more cautiously for the Christmas trade than in recent years, most of the surplus labor has been absorbed in one way or another. As early as November, applications for unemployment insurance and GI readjustment allowances were dropping off nearly 11,000 a week, or about 12 per cent.

Among the busiest firms just now are industrial chemicals, enamelling, and others serving many manufacturing industries. Slow business is reported by electronics producers and the makers of cosmetics, pens, and other items recently inventoried heavily for the holiday trade. The rubber industry looks forward to increased activity, now that natural rubber has begun to arrive in larger quantities.

The real depression area is Hollywood, where the movie industry is in a slump some observers say is worse than that of the 'thirties. Some 12,000 to 16,000 persons are jobless, and not merely as result of the protracted jurisdictional strike between rival unions. A drop in box office revenues from a budget-conscious American public, plus a severe narrowing of the foreign film market—caused, of course, by lack of foreign exchange with which to remit to U. S. distributors—have caused cinema moguls to wield the headman's axe prodigally.

Not merely yes-men and producers' relatives, but skilled technicians as well, have been among the casualties. Unemployed are 183 of the 585 members of the Screen Directors Guild, about 100 of the 400 Screen Writers, and a substantial percentage of the Screen Actors. Only about 600 "extras" are being employed on the average working day, whereas a year ago there were extra jobs for about 1,000.

Inasmuch as picture production customarily goes into the doldrums between the first of the year and early March, because of tax law peculiarities which base assessments upon inventories of finished film footage on hand, Hollywood wiseacres foresee further lean days for the screen capital before conditions can possibly improve. Latest figures on box office receipts, however, read far better than was generally predicted, and there is reason to believe the worst is over.

Skilled Workers Scarce

Local industrialists recently heard Army officers urge the need of a substantial reservoir of workers skilled in the industrial techniques necessary in case of another war. Older, more experienced men are constantly reaching retirement age and younger men are not being trained in sufficient numbers to take their place.

(Continued on page 62)

Economy Trying to Overtake Population

(Continued from page 61)

Some 10,000 apprentices now are receiving instruction in various trades and machine techniques in this area, but 6,000 of them are in the building trades, leaving only a modest number as a nucleus for the skilled crafts of tomorrow. This point of view forms a surprising sequel to the expected postwar joblessness that was scheduled by this time to see thousands of highly skilled war workers walking the streets hungry.

The need for well-trained workers is being felt acutely in a number of peace-

time industries — notably in the apparel trades, where postwar growth of the West's garment industry has led to a program aimed at training hundreds of needle-craftsmen.

Another sober reminder of the efforts quietly being made by the military to prevent another Pearl Harbor unpreparedness fiasco was the action taken by "JANMAT" — the Joint Army-Navy Machine Tool program—in "freezing" the war-surplus Alcoa plant here. Twice put up for sale to private industry, without bringing bids

anywhere within shouting distance of the giant plant's true worth, Alcoa now is being held for screening by JANMAT as a possible standby plant in the M-Day preparedness scheme. Some \$10,000,000 worth of machine tools and surplus industrial materials likewise have been withdrawn for screening.

This action on Alcoa is welcomed by local industrial leaders who are familiar with the vast and thoroughly modern facilities at the former aluminum reduction plant. They would like to see it kept intact at home, some day, for a new major enterprise large enough to utilize it.

Military Aircraft Advanced

The hungry aircraft industry is taking up more notches in its belt as it works away on its meager production orders for military planes. Though layoffs at several plants have spread much gloom locally, the array of orders so far placed shows that the Army Air Forces has apparently spent wisely the funds doled out to it by an economy-minded Congress. Some 17 new plane types were added to its stable of ultra-modern fighters and bombers. Although the number of such planes actually on order totals only 1,150, groundwork has been laid for a sweeping rejuvenation of the nation's air forces.

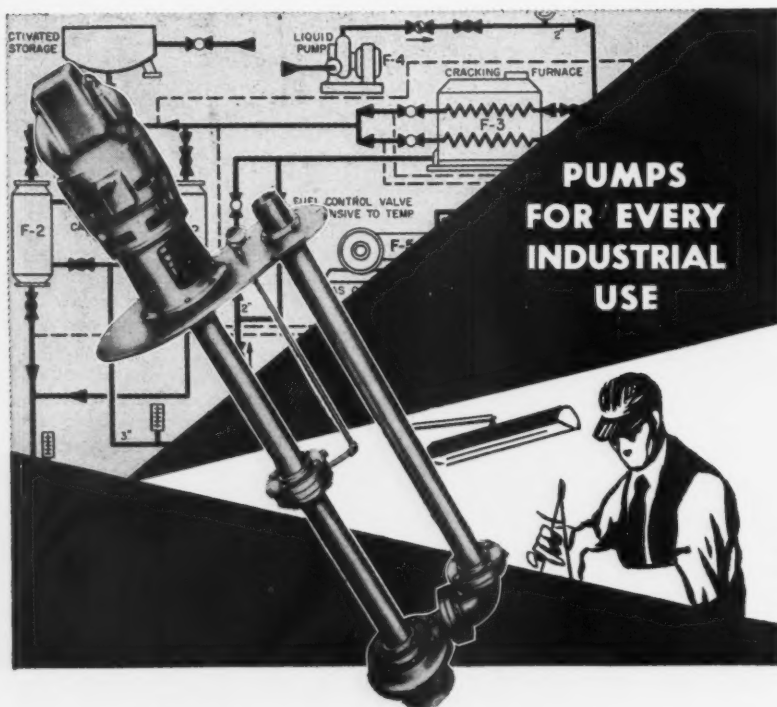
AAF has concentrated its scanty appropriations on developing and getting readying new types, "rather than expending the bulk of funds on existing models moving into obsolescence." Such advanced models as the Convair B-36, world's largest land-based bomber, of which 100 are on order, and the Northrop YP-49, a "flying wing" with no fuselage, and rated as the largest jet plane built, have unobtrusively become realities even while public attention was focused on the inquest of the Hughes plywood plane, celebrated with all the noisy drumbeating of a Chinese funeral.

North American Aviation soon will start production of its AT-6 plane in Holland, fifth foreign country licensed to build the company's trainers. Sweden, Canada, and Brazil likewise have been licensed, and the first Chinese-built AT-6 recently was test-flown.

Timm Aircraft, one of the wartime subcontractors to drop completely out of the aircraft field, has added a new product to its line. Already engaged in production of an automatic coin-operated vending machine for bottled soft drinks, Timm is making aluminum window frames, for which current millwork shortages offer a promising market.

Income Tax Dodge

Thousands of southern Californians suddenly became conscious of sharp twinges of the conscience when Federal income tax authorities recently announced they were examining escrow records of real estate transactions handled by local banks during the past several years. Hundreds of such sales never were reported in



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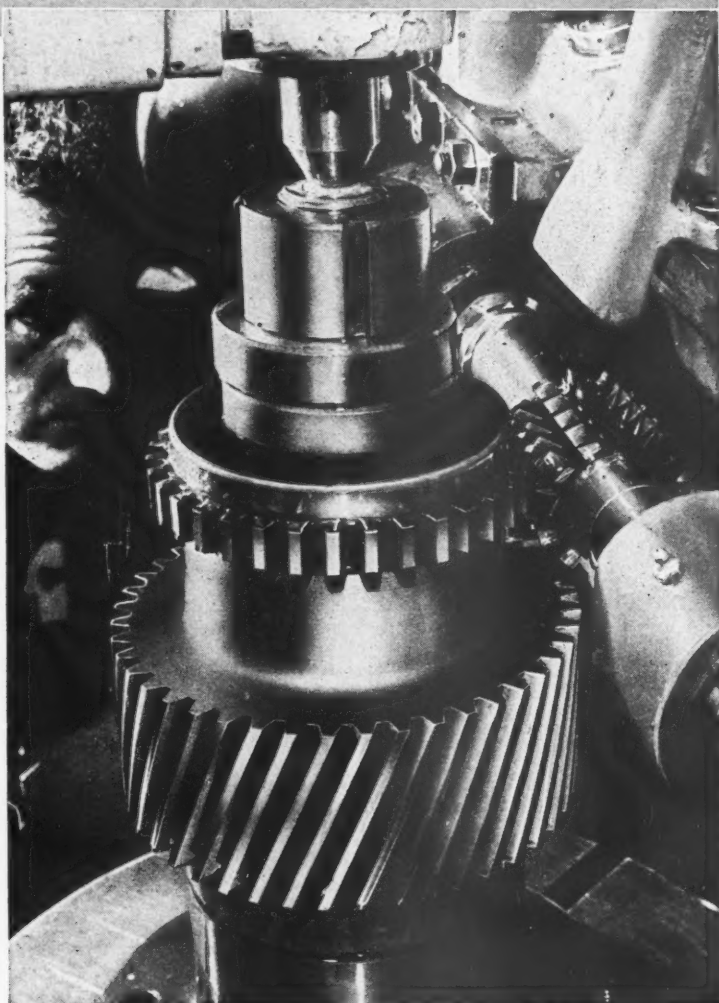
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Economy Trying to Overtake Population

(Continued from page 62)

income tax returns, although the seller usually was taking a fat profit. Leaving the door slightly ajar for the repentant to make a clean breast of their boom-time profits and receive clemency, the income tax sleuths soon had a long queue of tardy visitors waiting outside their doors, while law-abiding natives have been patting themselves on the back with much righteous satisfaction.

Enlargement of the Southland's tuna-fishing fleet this year enabled fishermen to turn in an all-time record tuna catch. The 12-month pack will exceed 5,000,000 cases, 10 per cent more than last year's. San Pedro recently won the distinction of becoming the nation's No. 1 fishing port in point of size of its landings, the weight of which has been duly verified by serious-minded cannery authorities, thoroughly immune against any California fishing whoppers.

Mysterious scarcity of sardines, albacore, and some other fish which once abounded in southern California waters has been under study by State and Federal authorities for some time. An RFC-owned trawler now is embarked on a year-long study of the Marianas, Carolines, and Philippine sea areas. U. S. Wildlife Service experts will plot fishing banks formerly

worked by a large fleet of Japanese vessels operating from the home islands and from Truk and Saipan. In recent years, American tuna-boat operators have had to remain at sea longer than formerly and go far into Central American and equatorial waters to get capacity loads.

San Joaquin Valley farmers, with the help of mechanical cotton pickers and unusually favorable weather, have completed their harvest nearly two months ahead of schedule. In Kern County, where the harvest brought an average of two bales to the acre (about \$425 worth), opulent ranch owners look ahead to a day when California may climb from its present place as fourth among U. S. cotton-producing states, to at least second place.

They base this idea on the fact that the county's 143,000 acres of cotton, now planted exclusively with a superior long-staple variety, reportedly are returning more bales to the acre than anywhere else in the world. Growers are forbidden by law to plant any other variety. They do not even replant seed ginned from their own cotton, but get a fresh supply from their association, which grows cotton exclusively for its seed, thus making certain that the pure strains will not deteriorate in time. This system is being copied widely elsewhere.

Now the valley is on the point of "retooling" with a new variety developed by the U. S. Department of Agriculture especially for the local climate.

Known as "4-42," it has a tensile strength of 85,000 pounds per square inch, as against 68,000 for the present "P-18" fibers. It also will take dye well, wiping out a disadvantage common to irrigated cotton. Local seers say the day will come when the West's apparel industries will be fed largely with textiles milled from cotton grown on Western farms—another step toward integration of the West's economy into a self-sufficient whole.

Court Ruling On Ore Dumps

Most mine dumps cannot be classified as "natural deposits" and therefore their operators are not entitled to depreciation allowances in paying their corporate income taxes, according to a ruling in Denver by the 10th U. S. Circuit Court of Appeals.

The ruling is that where the dump was set aside by the original owners with the intention of working it later, and therefore was virtually stockpiled ore, the depletion allowance may be taken. When leased or bought by other parties and worked as a new operation, it cannot be classed as a "natural deposit" and the depletion allowance cannot be taken.

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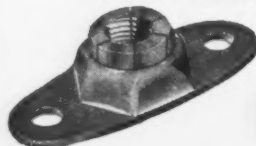
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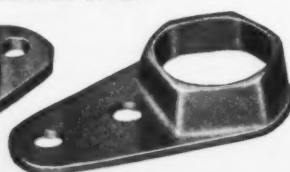
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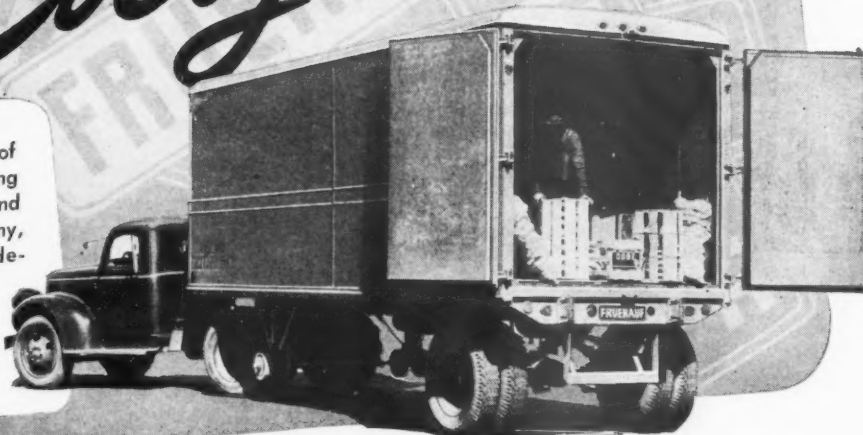
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● Pacific Fruit and Produce Company, one of the largest distributors supplying retail dealers in all but four of the states west of the Mississippi, has purchased a total of 30 New Fruehaufs in the past two years.



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REGIONAL REVIEWS

SIERRAS TO THE SEA

Redding Area Becoming Major Lumber Producer

\$14,000,000 in recent investments brings to area plywood factory, flooring plant, giant expansion of Anderson mill.

SAN FRANCISCO — Four major developments in the Redding, California, lumber industry over the year end have changed this region from an active segment of the Pacific Coast lumber industry to one of the major producing regions in the Far West. Approximately \$14,000,000 has been invested in this expansion. The total employment of the mills will run close to the 800 mark.

Largest of the projects is a \$10,000,000 program of the Ralph L. Smith Lumber Co., of Kansas City, who recently purchased the Deschutes Lumber Co. of Anderson. The plant will employ between 300 and 400 men and have an annual payroll of \$1,200,000. Enlargement of the present facilities will make possible sales of 100,000,000 board feet of lumber annually beginning in 1948. It will involve construction of an extra band mill, dry kilns, two planers, two dry sheds and complete remanufacturing facilities. Also involved was the purchase of 49,200 acres of timberland.

Most spectacular development is the U. S. Plywood Corporation and Harbor Plywood Corporation \$2,000,000 plywood factory seven miles south of Redding. The plant would be the largest plywood factory in the United States. Approximately 350 men would be employed in the operation which is expected to run for a minimum period of 20 years.

The corporation has purchased a vast amount of lumber, consisting largely of ponderosa and sugar pine of very high quality and virgin growth. Construction on the plant has begun and it is expected to start production by next October.

A \$1,500,000 flooring plant will be constructed in Millville as the result of a new drying process for California oak, recently perfected by Deal-Ryte Products Corporation of Los Angeles. The new plant will be operated by Oakwood Products Inc., a subsidiary of Deal-Ryte.

L. F. Benham, general manager of the plant, said the new process is the result of perfection of a new method of drying

California oak so that it equals or surpasses the best eastern oak as a flooring material.

The mill will employ between 250 and 300 men when full capacity is reached. Turnout will approximate 8,000 feet of flooring per eight-hour shift. Following completion of the flooring plant, construction of a knock-down furniture plant is planned with the employment of an additional 40 to 50 men.

Hat Creek Lumber Co. announces that a large remanufacturing plant will be installed in the Shasta Dam Area by a group of five lumber mills. The plant will handle approximately 200,000 board feet of lumber daily.

Besides these, another remanufacturing operation is scheduled for the Anderson area. This plant will occupy a 30-acre site and employ 30 men.

Bay Area Council Birthday

San Francisco Bay Area Council, Inc., celebrated the first year of its existence at a dinner meeting early in January. Earl O. Shreve, president of the Chamber of Commerce of the United States, vice-president of General Electric, and for a number of years the G-E manager in San Francisco, was the featured speaker.

The Council's report on its first active year of operation, 1947, summarized steps taken to maintain the present rate of industrial development in the Bay region—approximately \$110,000,000 annually since January, 1945; and outlined Council projects and activities, including formation of Bay Area committees on world trade promotion and maritime development, area planning, governmental relations, including Council action urging study of federally owned and leased properties, recommended transfer of Angel Island as a state park, and requests for equitable maintenance of military facilities needed in the Bay Area.

Other activities of the Council reported were: publication of a Bay Area directory of information sources for industry, trade

and commerce; a Bay Area economic survey, and a number of other reports and studies on area-wide development. The Council has also organized a Bay Area City Managers' Committee, a representative group from Bay Area Junior Chambers of Commerce and initiated formation of a Baywide group of County Supervisors.

The Stockton General Depot will become the Army's main supply depot for the West and Pacific areas, the Council reports. Earlier reports had indicated it might be moved to Utah.

The Port of Oakland has rejected a proposal to participate in any joint effort to promote shipping in the San Francisco Bay district "until all present restrictions" against Oakland and other ports in the East Bay are removed.

Proposals for a joint traffic bureau for the San Francisco Bay district, which includes the Port of Oakland, Richmond, and other ports of the Upper Bay, were made in San Francisco recently following the revelation that the area had dropped from third to fifth place among American ports in 1946.

A statement issued by the Port of Oakland cited minimum tonnage restrictions and arbitrariness against Oakland and charged that these "act as a barrier to the free movement of cargo" through the Port of Oakland.

Another speed record is reported in the construction of a warehouse building, 120 feet by 180 feet, for the Western Electric Company at Emeryville, California, in 53 working days and at a cost of only \$3.09 per square foot. The project was handled by the Building Division of the Vinnell Company, Inc., at Alhambra, Calif., under the personal direction of G. Warren Schloat, chief engineer.

Within 53 working days after construction was started, the finished building was turned over to J. E. Taggart, manager of the Emeryville distribution center of Western Electric. The warehouse building is constructed of structural steel and concrete block.

Manufactures Census To Be Taken

A complete picture of the current industrial situation in the Pacific Coast States, recording the vast changes which have occurred since 1939, will be presented in the 1947 Census of Manufactures, to be taken early in 1948, according to Director J. C. Capt, Bureau of the Census, Department of Commerce.

In 1939 there were 17,817 manufacturing establishments in the three Coast states. California had 12,329 establishments, Oregon 2,248, and Washington 3,240. The value of products manufactured in the three states amounted to \$3,800,203,768. Of this total, California accounted for \$2,798,179,523, Oregon for \$365,374,436, and Washington for \$636,649,809.

The questionnaire, which will be mailed to all United States manufacturers in January, was developed with the aid of industry in a series of conferences over the last three years. Information will be obtained on production, employment, wages, materials consumed, expenditures for plant and equipment, inventories, and related items.

Since the 1947 Census of Manufactures is being conducted primarily by mail, Director Capt urged all manufacturers to return their completed questionnaires promptly in order to speed up the availability of the results and keep the costs down. "Follow-ups by mail, telegram, and visits by field personnel are costly," Director Capt said. "Cooperation by manufacturers in mailing their questionnaires promptly will cut costs as well as speed publication of the results. Early publication of the results of the 1947 Census of Manufactures will enhance their value and give business vital information badly needed to meet current conditions."

Fish Story

Oregon's state seafood laboratory at Astoria has developed a fish stew, similar to beef stew, as a possible means of creating additional demand for bottom fish. An experimental pack of 10 to 20 cases (estimated price: \$9-\$10 per case of 48 one-pound cans) is to be prepared and sent to European countries as samples. If successful, the stew is also expected to provide an outlet for another surplus Northwest product, potatoes.

New Method Uses Low Grade Ore

A new development that is in the process of taking place and promises greatly increased activity in lead, zinc, and silver mining operations in northern Idaho was described to delegates attending the fifty-third annual meeting of the Northwest Mining Association at Spokane early in December. Charles E. Schwab, mining engineer for Bunker Hill & Sullivan at Kellogg, Idaho, said that the first six months of 1948 will be spent preparing a block of 300,000 tons of low grade lead-zinc ore for production by the block caving method.

Use of the block caving method will require the installation of a primary crusher underground to reduce the blocky ore before transportation to the mill. The low grade ore will be drawn upon by the mill to utilize full capacity after all of the high grade ore that can be mined is processed.

Competition Threatens In Latin America

American manufacturers now have the upper hand in Latin American markets, but it will take proper representation to keep this business, reports William Brum-

back, director of foreign markets for the Hallett Manufacturing Company, on his return from South America.

"In spite of aggressive solicitation by British and Swedish manufacturers' representatives, American equipment is still preferred because of its advanced design, dependability, and economy," he reports. "The inability of foreign manufacturers to make deliveries is the only factor that prevents them from making serious inroads on this potentially valuable American market, for special concessions in the form of extended credits are being offered by both English and Swedish industry in an attempt to recapture their lost markets."



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REGIONAL REVIEWS

THE PACIFIC NORTHWEST

Mountain Area Jittery Despite Healthy Outlook

**Local picture bright, with metal mines kept humping,
big outlay for building, and high employment certain.**

DENVER — Despite every evidence of good health and prosperity, the Rocky Mountain area ushered in the year 1948 with fingers crossed and an ear cocked for the first sound of trouble. It recalled the early-day drama critic in Denver who reported that a visiting Thespian "played the King as if he expected somebody else to play the Ace."

Just what causes the anxiety isn't clear. Maybe it is the Russians. Or inflation. It may be the hangover from having eaten too well and drunk too much. Certainly any appraisal of 1948 and its prospects for the business community leaves the observer impressed with the year's promise.

Perhaps the hour is ripe for the arrival of a great philosopher with the common touch. Another Will Rogers, please. Even a top-grade politician would be welcome—someone big enough to rally the nation with some great truth like: "We have nothing to fear but fear itself!"

Speaking of politicians, there is a supply of money in Denver taking bets on General "Ike" Eisenhower as the man who will be elected to the Big Job in 1948. Admitting that he is poison to the Republican party bosses and a bad dream the Democrats don't even want to look at, there is plenty of wise talk to the effect that the Republicans know that the one man able to beat Truman is Eisenhower and they would rather win with him than wage a futile contest backing somebody doomed to run second.

Blow From Joe?

Sorrow seems to be the only reaction to the idea that Truman's runningmate probably will be Wyoming's great Senator Joseph C. O'Mahoney. Everybody admits he is plenty big for the vice presidential job—too big, in fact. The Senate needs men of his calibre and the vice presidency is a graveyard. The West, which lost most of its important congressional posts in the last election, would be in a sorry state indeed if the veteran O'Mahoney decides to resign.

Another political loss to the West is likely if Colorado's Senator Ed C. Johnson (another Democrat) goes through with his announced plan to retire this year and let somebody else have his job. He, like O'Mahoney, can let somebody else have his Senate seat but not his seniority and important committee posts. Although the switch of power to the Republicans last election caused a disastrous (for the West) switch of chairmanships on important committees, it still is true that a veteran like O'Mahoney or Johnson stands in far better position to represent his constituents than a newcomer, however competent the tyro might be.

O'Mahoney and Johnson are not left-wingers, as their opposition to the court-packing scheme some years back showed, but neither are they reactionary Democrats of the kind that hate anything modern or progressive. Both men know the West and its problems intimately and their judgment is accepted by many of their colleagues. Businessmen in Wyoming and Colorado feel that we can't afford to lose such men from the Senate, this year of all years.

Mining Prospects Good

No phase of the West's industrial health is so significant as the non-ferrous metal mining business and this is one of the fortunately-placed industries as 1948 gets under way.

U. S. copper mines will be kept humping all year to turn out enough of their product, at 21½ cents a pound, to meet industrial demand, government stockpiling and the demands of the Marshall plan. Output in 1948 will be about 10 per cent higher than in 1947, experts agree. But consumers want at least 15 per cent more copper than in 1947. Imports may total around 400,000 tons, which would be nearly a third of total U. S. consumption in 1947. The excise tax of four cents per pound is off now.

Lead producers hope to increase their output in 1948 to 425,000 tons after making 400,000 tons in 1947. However, scrap

lead is expected to drop from 425,000 tons to 400,000 tons, giving a total domestic supply of 825,000 tons or the same as in 1947. U. S. consumption of lead in 1947 was 1,100,000 tons and 1948 demand is just as great.

The government's stockpile has been used up and private stockpiles are said to be none too big. Imports probably will run about 200,000 tons in 1948. Present price of lead is 15 cents a pound and it is expected to hold during most of 1948. Missouri output is expected to decline but the loss will be made up by greater lead production in the Western states, particularly in Idaho. Lead stays at the top of Uncle Sam's list of needed strategic materials.

Silver consumption in 1948 is expected to match 1947's total of about 85,000,000 ounces, with industrial users going to Mexico for much of their supply at about 75 cents per ounce. Domestic producers of silver are guaranteed 90½ cents per ounce from the government's treasury, but industrial buyers of silver usually can get all they need at the market price which in 1947 ranged from 86¼ cents to 59¾ cents.

Zinc supply exceeds demand and stockpiling by the government now is stabilizing this end of the mining industry with a pegged price of 10½ cents expected to continue throughout 1948. The government now has about 350,000 tons of zinc on hand. Domestic consumption and supplies furnished to friendly nations totaled 813,000 tons in 1947, considerably short of the 847,000 tons produced in the U. S.

Aluminum and other metals are expected to have a good year in 1948. Even gold mining is picking up, although it isn't expected to amount to much until or unless labor costs hit the toboggan. But the mining world isn't moaning these days. It has bigger things to do.

Ride 'Em on a Rail

Punishment for undesirable persons used to be "ride 'em out of town on a rail."

(Continued on page 70)

For Conveying Small Containers, Packages and Parts..

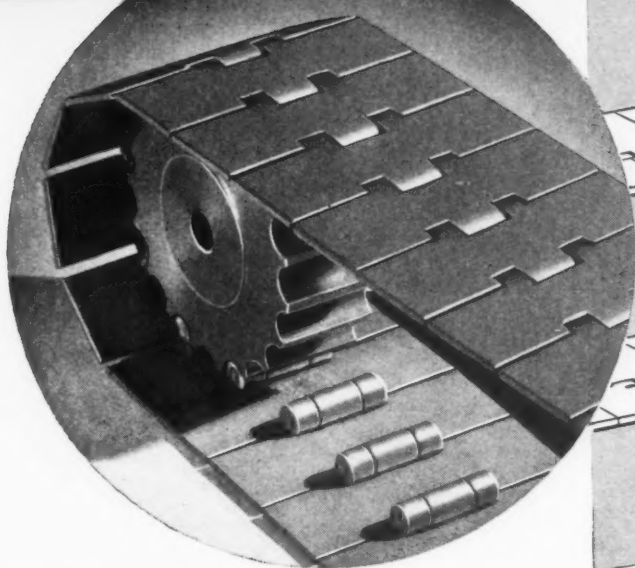


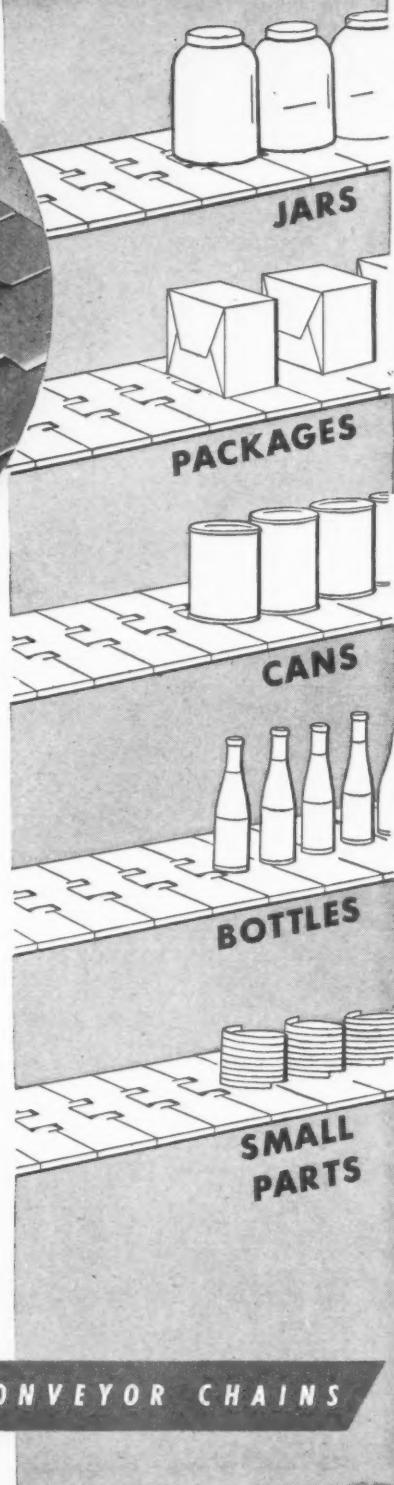
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Rex Table Top Conveyor Chain is simplicity itself. A one-piece platform link and a pin are the only parts. There are no attachments to loosen or "wobble" . . . no pockets to catch and hold foreign material. Sprocket tooth bearing pressure is spread over the entire length of the joint . . . giving unusually wide bearing area. Pin is relieved of all load when flexing because each sprocket tooth contacts both leading and following links simultaneously. Table Top just has to last longer.

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CHAIN BELT
REX
COMPANY

... DRIVE AND CONVEYOR CHAINS

Mountain Area Jittery

(Continued from page 68)

Riding on a rail, or a pair of rails, still rates as punishment in many of the mountain states. Normally the railroads can plead poverty as the excuse for the gawdawful condition of transportation, but recent earnings statements of the railroads make that excuse seem a bit inadequate.

If ever there were a time when the railroads might do something to improve their service, that time is now. But is anything being done, or even contemplated? Not so far as the folks off the main line can see. They are still in a 1905 world so far as railroad transportation is concerned. And why?

Perennial lament of the eastern slope of the Rocky Mountain region is the lack of a good railroad line running north and south from Denver through Cheyenne, Casper, Billings and Lewistown to Great Falls, Montana. Nothing less than a streamliner is wanted for this great run.

Streamliners run out of Denver in every other direction, to Chicago, to St. Louis, to the Texas cities and the Gulf Coast, to California and to the Pacific Northwest. But north? Take along the biggest book and prepare for a dreadful journey. After 24 agonizing hours you will get to Billings. Great Falls? Well, that is another day's trip.

Because of this frightful north-south service, or lack of it, Wyoming and Montana business habitually turns toward centers to the east and the west which can be reached by fast transportation of the modern sort. Denver businessmen, stupidly, put up with this state of affairs because, never having had much of the Wyoming and Montana business, they don't know what they are missing. But the worm seems to be turning, as the officials of the Burlington railroad will be learning before long.

Big Outlay Coming

With so much money being spent in 1948, business can't help humming. There isn't any other way to figure it. In Colorado the employment counsellors are still scratching their heads trying to figure out how to get additional workers in almost every category.

Big building projects are breaking loose at long last with a great rush. The city of Denver and the University of Denver have multi-million dollar construction programs that can't be held back any longer. Eight million dollars worth of highway work is being launched by the Colorado state highway department during the first four months of 1948.

Railroads, utilities, industrial concerns, wholesale and retail enterprises account for many millions more. And houses for jammed-up Denverites to the tune of \$40,000,000 will be built during 1948, compared with \$30,000,000 in 1947. City building inspectors figure the '48 housing total may mushroom up to \$60,000,000.

Denver Makes Sense

When the honeymoon ended, Denver found its boyish new mayor, Quigg Newton, wasn't above blundering now and then especially in his handling of the press and similar matters. To make matters worse the city fathers slapped on a sales tax of one per cent, which came on top of the existing two per cent state tax. Grumbling broke out in all parts of the city and plenty of critics said, "I told you so..."

But they speak too soon. Quigg Newton's term is for four years, and he came in only last May. Tackling first things first, he cleaned up the long-standing stench in the city health and charities department. Today matters in this realm are handled by specialists of national standing and many deplorable situations are being righted. The head of every Denverite is held just a little bit higher as the city's shame has been relegated to the pages of history.

What is happening in the city of Denver since Quigg Newton became mayor is worth a whole story by itself. Latest step

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Write for the new Zenith catalog sheet



is to hire E. L. Mosely as head of the city's new department of public utilities. Mosely is the man who made the city of Colorado Springs nationally famous for its well-run government and municipally-operated utilities as well as for its tourist attractions.

Denver's gain was a loss for the Governor's Committee on Resources Development, the 250-man statewide brain trust assembled by Gov. W. Lee Knous to come to grips with the undeveloped portion of the state's potentialities. Mosely had been snapped up by Governor Knous and named executive director; he was bringing the huge and nebulous Committee into position to accomplish something, aided by financial assistance from the national Committee for Economic Development and certain industrial "angels" in Colorado.

With Mosely's jump to the Denver city government, the Governor's Committee has secured Elton K. McQuery as acting director. McQuery was financial secretary to the governor. Incidentally, in order to get away from anything that might smack of politics and to give the enterprise a permanent character, the name has been changed from the Governor's Committee to the Colorado Council on Resources Development. Despite its difficulties in defining its purpose and getting beyond the preliminaries, the new Council is considered one of the most ambitious attempts made by any American state for the promotion of new industries.

Fire Fighting With Bombs

Experiments of last summer in aerial bombing with water-filled projectiles of forest fires in western Montana were described by Jack S. Barrows, fire research specialist for the Northern Rocky Mountain forest and range experiment station. In last summer's bombings regular Air Force wing tanks holding 165 gallons of water or chemicals were used. The first dive bombing attacks by P-47s did not prove as successful as later glide bombing attacks when the bombs were fitted with tail fins.

High level attacks were made with B-29s using Norden bomb sites and equipping the bombs with proximity fuses which exploded the bombs above the fires. Glide and dive bombing attacks split the bombs on impact with the ground, spraying the base of the fires with mud and water. Both methods proved effective, but the Forest Service and the Air Force have designed a proposed special bomb which they hope to have manufactured for further tests this year.

Aerial bombing alone is not considered capable of quenching a forest fire, but it does provide an effective means of hitting fires when they are still small and retarding their progress until fire fighters can reach them by parachute or on foot. The

Air Force considers the job so valuable for training purposes that recommendations have been made to provide a group of 75 fighters and 30 bombers for assignment to attacks against fires in western Montana in 1948.

Navy Projects

Among new projects under way by the Navy are Arctic huts, light, sturdy, easily assembled, well insulated, pilot models having been submitted by Douglas Aircraft Co. and Southern California Homes, Inc.; also, a better ship-to-shore overhead tramway on the principle of the old breeches buoy, being worked on at Port Hueneme, Calif.

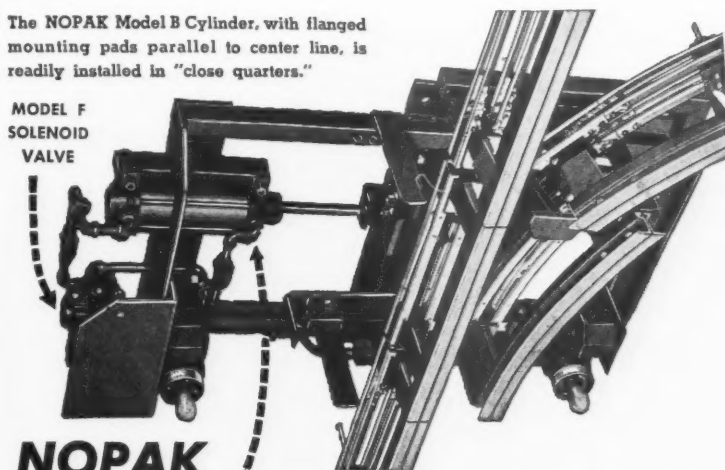
Practical Industrial Design Course

Recognizing the growing importance of the industrial designer, California Institute of Technology, Pasadena, is offering a professional course in industrial design on the graduate level.

Evidence of the need for such a course comes from Phillip McConnell, executive secretary of the Society of Industrial Designers of New York. In a recent bulletin summarizing the answers to a questionnaire sent to leading industrial designers, he said, "The mere fact that in 22 firms who answered there were positions open for 66 trained designers is an indication that sufficient training is not available."

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REGIONAL REVIEWS

THE PACIFIC NORTHWEST

Columbia Basin Project Gets Funds From Congress

With work scheduled to stop February 1 for lack of funds, Congress approved \$13,584,000 deficiency appropriation

PACIFIC NORTHWEST.—The news at Christmas time from Washington, D.C., that Congress in the last days of the special session had approved a \$13,584,000 deficiency appropriation for continuation of construction work on the Columbia Basin project was appropriately cheerful. Construction contractors and equipment manufacturers had previously been notified by the Bureau of Reclamation that all funds would be exhausted and work would necessarily be halted on Feb. 1, unless additional funds could be secured before that time.

This news composed a particularly gloomy outlook here where the Columbia Basin project is looked to as the most important development that has taken place in the area in many years. The addition of some 17,000 farms and a possible population increase of more than 100,000 persons between 1955 and 1965 as contemplated under the project development plans, are expected to improve materially the market possibilities in the Northwest.

Change in land use from dry farming, or non-use, to intensive, irrigated cultivation with the consequent increase in population density and requirements for services is also expected to prove a definite drawing power for the establishment of manufacturing and processing industries in and adjacent to the project area. The principal structure of the project, Grand Coulee dam, together with Bonneville dam, has already been primarily responsible for the establishment of the aluminum reduction industry in the Northwest, and the promise of increasing importance of this area of the county in electro-metallurgical and electro-chemical industries.

The area of the project comprising some two and a half million acres in south central Washington has been developing into a boom area, rather slowly since the beginning of construction on Grand Coulee dam in 1933 and accelerating rapidly since the

end of the war in 1945, when the promise of an early beginning of work on the irrigation facilities became apparent.

Such communities as Ephrata, Moses Lake, and Pasco have grown rapidly in the past two years with an influx of businessmen intent on providing services which will be required by a growing population. Any threat of postponement in the development of the project is naturally taken very seriously by these people, so the past few months have been a period of considerable concern.

SEATTLE — Nine new industries were established here during the month of November, according to the records of the industrial department of the chamber of commerce. Five existing businesses completed new plants, and 11 firms expanded their facilities during the month. Total capital investment in new plants and expansions totaled \$3,678,500.

Great Northern Railway Co. has awarded a \$750,000 contract to Atherton Construction Co. for rebuilding Pier 88. The existing warehouse structure at the shore end of the pier will be dismantled and a two-story, reinforced concrete, office building constructed. The remainder of the warehouse will be dismantled to the deck and replaced by a structural steel frame warehouse.

Commercial Ship Repair has purchased the plant of the Winslow Marine Railway & Shipbuilding Co., and will operate the Winslow yard, as well as its own facilities in making voyage repairs, conversions, and drydocking.

Now, with the deficiency appropriation approved, nearly everyone in the Northwest who is familiar with the possibilities of the project is hoping that Congress will continue its recognition of the project's importance with adequate appropriations for the next fiscal year.

Contributions of the power phases of the Columbia Basin project to the industrial development of the Northwest are amply underlined in the tenth annual report issued the end of December by the

Bonneville Power Administration, the federal agency established by Congress in 1937 to sell at wholesale the hydroelectric energy generated at Bonneville and Grand Coulee dams.

Following completion of the first generator at Bonneville in 1938 through 1940 the total sales of electrical energy to all industrial users by BPA (not including sales to industrial users by private and public agencies purchasing Bonneville power) amounted to 21,000 kilowatt hours. Up to this time no aluminum reduction plants had been placed in operation in the Northwest. In 1941, with the start of operations at the Alcoa plant at Vancouver and the later opening of the Reynolds plant at Longview, BPA power sales to the aluminum industry amounted to nearly 523,000,000 kilowatt hours and sales to all other industry to 4,800,000 kilowatt hours.

By 1944, when the installed rated generating capacity had reached its peak, the BPA system was supplying the aluminum industry with 5,454,000,000 kilowatt hours of electricity during the year, and all other industry was taking 935,000,000 kilowatt hours. This was the highest output to date, but will probably be exceeded in 1948 when the installed rated generating capacity will reach a higher point than it did in 1944. All years, incidentally, are federal fiscal years ending on June 30 of the year mentioned.

During the fiscal year 1944, power used by the aluminum industry took 63 per cent of all power sold by BPA, although the income to BPA from the aluminum industry represented only about 57 per cent of the total revenues from power sales because of the relatively high and favorable load factor of the aluminum reduction industry. During 1945 the power use by the aluminum industry declined slightly, and in 1946 reached the lowest point since 1942. It was during this period that the

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Columbia Basin Project Gets Funds

(Continued from page 72)

war ended and the war-built aluminum plants were closed down, although the Alcoa works at Vancouver and the Reynolds works at Longview remained in operation continuously.

In 1947 the aluminum electrical demand rose rapidly again to nearly its 1945 figure. The Mead works at Spokane and the Troutdale works at Portland came back into production, leaving only the Tacoma works and a small portion of the Mead works not in operation. The actual sales to the aluminum industry in the last fiscal year amounted to 4,253,000,000 kilowatt

hours, representing about 52 per cent of all BPA sales, and providing about 41 per cent of all BPA income.

Sales to all other industries have decreased more since the end of the war, or rather have not recovered as well up to the present time, because of the shut-down of shipyards and electro-metallurgical works other than aluminum and the great decrease in aircraft manufacturing. During 1947 power sales to all industry other than aluminum amounted to only 551,000,000 kilowatts, slightly under seven per cent of the total sales, although they

brought in slightly over 7½ per cent of the revenue because of a less favorable load factor.

Perusal of the cumulative figures for the 10-year life of BPA indicates even more strikingly how closely allied have been the growth of the aluminum industry and the generating capacity of northwest hydroelectric plants. Aluminum has utilized 22,870,000,000 kilowatt hours, which represents 57 per cent of the BPA sales, and has paid about 50½ per cent of BPA income. Over the same period sales to all other industry amounted to 3,604,000,000 kilowatt hours and 12 per cent of the income. Thus the total direct use by industry amounted to practically two-thirds of all energy sales and provided nearly one-half of the income which is dedicated largely to repayment of construction costs of the project.

Other users of BPA power are principally utility organizations. Publicly owned utilities have taken 9½ per cent of the power sold during the past ten years, and privately owned utilities 23½ per cent. These latter two customers have taken

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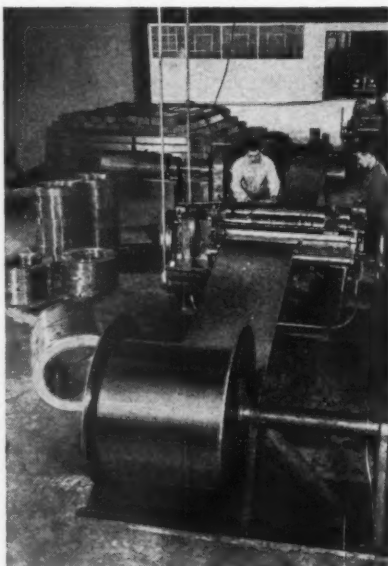
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TACOMA—Pacific Boatbuilding Co. will convert its facilities from the production of fishing boats to that of smaller, aluminum pleasure craft. Production of the 23-ft. aluminum boats is expected to get underway following expansion of the yard and employment of additional workers. Production of fishing vessels will be turned over to Puget Sound Boatbuilding Co.

City officials are planning to employ an engineer to conduct a smoke pollution survey as the first step toward the formulation of a smoke abatement ordinance. Passage of such an ordinance has been urged by members of the Tacoma Engineers Club as a civic improvement project.

St. Regis Paper Co. expects to have in operation by the end of 1948 its 240-ton-per-day kraft paper mill on which construction has started. Further expansion of the local plant will include a multiwall bag plant.

power for resale to the ultimate consumer and undoubtedly a large proportion of their sales have been to industrial consumers.

Power Growth and Industrial Demand

In his letter transmitting the annual report to the Secretary of the Interior, Bonneville Power Administrator Paul J. Raver points out the close relation between the development of power in the Northwest and the growth of demand by industries for that power.

Raver's letter said, in part: "The year's operations were accompanied by a growing concern over the power supply situation in the region—a far cry from the situation that confronted the Administration at the time of its inception in 1937 when Bonne-

ville and Grand Coulee dams were generally regarded as 'white elephants' by those who ridiculed the opinion of Congress that markets existed or could be developed quickly in the Pacific Northwest for the power being developed at the two dams.

PORTLAND — Fifteen new industries were acquired in this area during the month of November, and in the same period eight firms made expansions and improvements to their plants according to the monthly report of the industrial department of the chamber of commerce.

Pacific Power & Light Co. has announced plans for the installation of an additional 50,000-kilowatt generator in the power house of Ariel dam on the Lewis River midway between Vancouver and Kelso, Wash. Cost of the improvement is estimated at \$3,000,000.

The Oregon-Washington Fertilizer Co. will re-establish its manufacturing operations here which were discontinued during the war. The company has announced plans for construction of a new reinforced concrete mill, warehouse, and office building.

"Phenomenal recovery of industrial loads temporarily lost at the close of the war while plants converted to a peace-time basis, plus demands of new industrial operations, increased commercial and domestic as well as rural requirements combined to absorb excess power in the region.

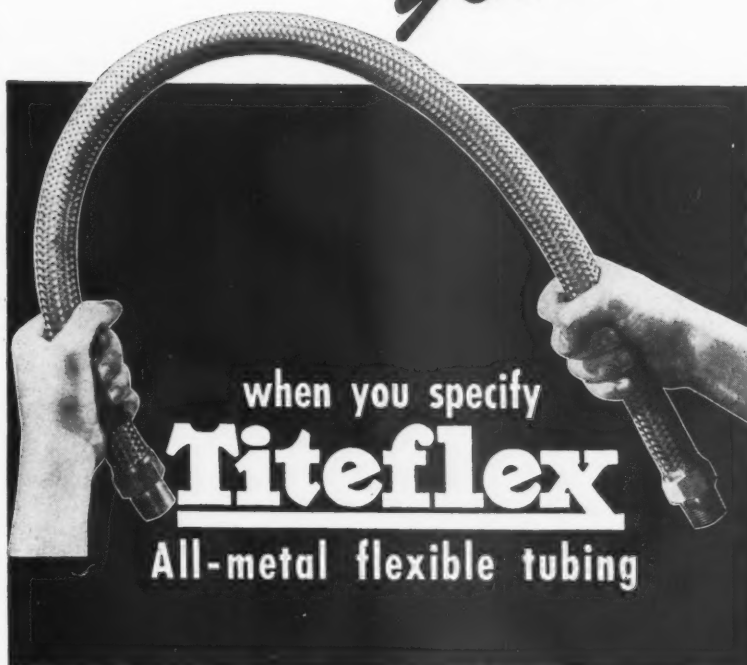
"The rapid growth of loads in the area leaves little doubt that the Pacific Northwest will continue to experience an acute power supply problem for years to come, and that only the continued speedy installation of new generation in existing federal, municipal, and privately owned plants and the construction of new projects along the Columbia River system and elsewhere will provide an adequate and final solution."

Net Surplus For BPA

Incidentally, it may be of interest to note that the BPA report shows a net surplus for the 10-year operating period of some \$23,000,000 after deductions for operation, maintenance, depreciation, and interest from the total receipts of some \$105,000,000. While there may be many who would question the methods used in setting up project cost repayments and various other items in the accounting system, there can be no question but what under the established system the basic Bonneville rate of \$17.50 per kilowatt year is fully adequate.

On December 12, the western division of the Pacific Northwest Power Pool, which comprises the Bonneville Power Administration system and the systems of the Washington Water Power Co., the Portland General Electric Co., the Pacific Power & Light Co., the Puget Sound Power & Light Co., and the city light departments

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LOS ANGELES BOSTON SAN FRANCISCO TORONTO

Columbia Basin Project Gets Funds

(Continued from page 75)

of Tacoma and Seattle, met an instantaneous peak demand that required more than 96 per cent of the total estimated generating capacity. The outgoing 2,847,000 kilowatts exceeded last January's estimate of this winter's peak demand by 22,000 kilowatts.

Such heavy loads are expected to recur during the months of January and February, indicating that the system will be operating with considerably less than desirable reserve. By the end of February an

eighth generator should be in operation at Grand Coulee dam, increasing the amount of available power by 108,000 kilowatts. Another similar unit is expected to be in service by the end of May, but additional industrial loads for which future contracts have already been signed will probably absorb a good portion of the increase in available power supply.

The Bureau of Reclamation has three more generators on order for installation at Grand Coulee, but these will not be in-

stalled and operating until sometime in 1949. During January the Bureau plans to call for bids for three more turbines and generators at Grand Coulee. These units are to be ready for service during 1950 and will bring the installed capacity to within 83 per cent of its ultimate and well over the estimated available prime power.

Spokane Magnesium Plant

Power is one of the controversial points about which revolves the eventual fate of the war-built magnesium reduction plant

SPOKANE — North Plywood, Inc., of Tacoma and Seattle, has purchased a one-story, 265x230-ft. frame building here together with 14 additional lots on three sides of the building. Although North Plywood officials have made no announcement, it is expected that the company will establish a plywood manufacturing operation on the property. Spokane Terminal Co. submitted the highest of three bids for annual rental of 14 warehouse buildings at Geiger Field. The buildings are a part of the property taken over by the city from the Army when it received the field to be used as a municipal airport.

near Spokane. War Assets Administration opened bids for lease of the plant on Dec. 15, the second time during the year that bids had been received. After the high bidder at the first opening failed to exercise the option offered him, WAA announced that no bids for lease of the plant would be considered until assurance could be had that power would be available for operation of the plant. Shortly thereafter the Chromium Mining & Smelting Corp. convinced WAA that Bonneville had assured sufficient power for operation of a portion of the plant and the bid opening was announced on about a month's notice.

At the opening two bids were received and a verbal protest against opening of bids was made. The two bids accompanied by certified checks were from the Electro-Metallurgical Co., which built and operated the plant for the federal government during the war, and from the Chromium Mining & Smelting Corp. with a combined and supplementary offer from the Pend Oreille Mines & Metals Co.

Both bids were so involved and hedged about with restrictions that it seems questionable whether either will be acceptable. The verbal protest was made by James K. Morley, Seattle industrial engineer interested in development of various magnesium applications, who stated that insufficient time had been allowed to permit the preparation of detailed bids by all parties interested in securing use of the plant.

Metallurgy Developments

Two rather interesting possibilities of future metallurgical developments came out during the reading of the bids. Chromium Mining & Smelting Corp. in a

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Precisely in the same way that KIRKSON Sheet Lead and Lead Pipe are made to provide the longest and most trouble-free service for the handling of corrosive chemicals, so is the KIRKSON organization geared to give you the best possible delivery.

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detailed analysis of its proposed use of the plant stated that the four 7,500-kilowatt furnaces used in the original operation for the production of ferro-silicon could be utilized without change for the production of ferro-manganese, ferro-chrome, or ferro-chrome silicon. Metallurgical engineers present at the bid opening questioned this statement on the basis of accepted processes for production of the four metals.

Pend Oreille Mines & Metals Co. proposed to use the electrical magnesium furnaces for production of zinc by a new process on which the company has been conducting experiments for the past year. If the process proves to be successful after a 6-month test in the magnesium furnaces, the company would undertake a full-scale smelting operation.

Permanent Lumber Production

Permanent production of lumber from Western forest lands was the principal topic of discussion at the Western Forestry and Conservation Association convention in December. The late Warren G. Tilton, forest engineer for the West Coast Lumbermen's Association and who succumbed to a heart attack since making his address, said the West is definitely much further advanced in forest management at the present state of cutting than any other region in the United States or, perhaps, the world, while still using virgin timber.

Tilton urged that the annual timber cut on publicly owned land be increased over a 20 to 30 year period to improve the balance between saw timber, pole size, and seedlings and saplings, and to eliminate a possible drop in production within the next 15 to 20 years when previous cut-over land will not be in position to provide commercial timber. Public holdings have 80 per cent of their timber in saw timber size, said Tilton, while private holdings not committed to management by forest products users have more than 70 per cent of their area in trees of less than saw timber size.

In the Douglas fir region (western Oregon, Washington and British Columbia) land ownership is evenly divided between public and private ownership, and about 3,000,000 acres of industrially owned land are committed to maintaining a permanent cut of about two billion board feet per year. Forest Service, Oregon & California revested land administration, and other public ownerships will permit a total annual cut of about 2,700,000,000. Combining the two figures gives an annual cut of 4,300,000,000 board feet less than the allowable cut considered possible in the region, but private stands with immature timber are not now capable of supporting such a cut.



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There's no mystery about it. It's just that men with loaded trucks simply can't move any faster in crowded aisles and on congested loading platforms. But it's a slow-down just the same . . . and a costly one.

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REGIONAL REVIEWS

THE WASATCH FRONT

1948 Seen As Year of Flourishing Industry

SALT LAKE CITY—The New Year found Utahns in a bright economic mood. They could look back on 1947 as a year of expanding industrial foundations, on which employment, trade and income must rest. And they could look ahead to 1948 with confidence that the upward trend will continue, unless the nation or the world goes into an economic tailspin.

The past year probably produced the greatest industrial advancement that the area has ever experienced in a single year. And enough projects are scheduled for the new year to make 1948 look as good or better than 1947 did when it began.

Statistics in terms of dollar volume, of course, are badly distorted by inflationary fluff. But after this inflation increment is squeezed out, the 1947 picture is an impressive one.

Total employment, a good measuring rod of actual industrial, business and agricultural activity, was up some eight per cent in 1947 over 1946, which can be accurately described as a boom year. And non-government employment increased by a healthy 13.3 per cent.

The 1947 employment represented a jump of 22.7 per cent over 1945; 18.8 per cent over 1944 (when war employment was still running high) and was only some two per cent under 1943, when war pressures had pushed all available women and children into the labor picture. The increase over the pre-war year of 1940 was 48 per cent.

In terms of dollar volume, which reflects both real growth and inflationary distortions, the industrial payroll for 1947

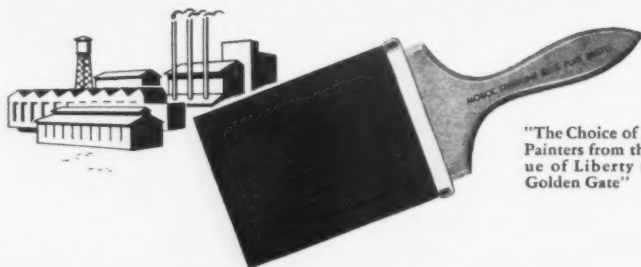
was up 23 per cent from 1946, 10 per cent from 1943, the peak war year, and 17 per cent from prewar 1940.

Outlook For 1948

The forward look into 1948 indicates oil, steel, cement and plaster will produce substantial new employment during 1948. And this conclusion is based on projects which are already in the new year's deck of cards rather than on hopes of what might happen. The outlook for the state's major sources of income can be summarized as follows:

OIL: Standard of California has announced plans to build a \$5,000,000 refinery in Salt Lake City and a \$5,000,000 pipeline from the Rangely field in Colorado. Utah Oil Refining Co. has a \$3,700,000 expansion program under way. W.

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For the BIG JOB in All Industries

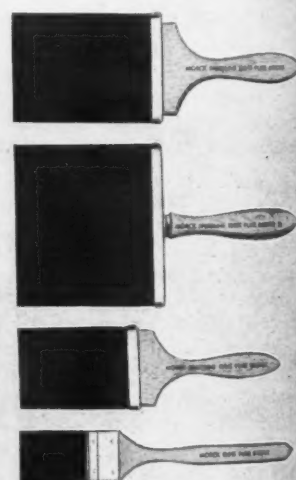
Faster painting, plus longer brush life is what you want... and that's what you get when you specify Morck Speed-Line 100% Pure Hog Bristle Brushes. They have the capacity and stamina to speed up work on the production line and in all maintenance work.

Morck's Speed-Line Brushes are built to the specifications of master painters... Designed with the features of feel, balance, toed-in ferrule... 100% Pure Hog Bristle... thin handle and built by master brush craftsmen to "lay the paint on" with speed and perfection.

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satch Oil Co., control of which was recently acquired by Phillips Petroleum, plans extensive improvements during the year at its Woods Cross and Pocatello refineries. And the company recently strengthened its production and marketing position by purchasing (with a Texas firm) all the stock of two major independents in Montana. Several major companies and a score or more independents are carrying on extensive explorations for new production fields over an area comprising about half the state.

STEEL: Geneva's \$18,600,000 program for adding facilities to produce hot rolled coils is expected to get seriously under way during the new year. Chicago Bridge & Iron Co. is getting ready to build a fabricating plant to serve the Western states. Henry J. Kaiser is negotiating for the surplus blast furnace at Ironton and, if the deal goes through, plans to have it into full production by early spring. A substantial, but unannounced, expansion in pipe production is also slated for the new year. Several other fabricating projects are in the investigative stage.

BUILDING MATERIALS: The cement industry is well along in a large expansion program and two wallboard and gypsum plants being built at Sigurd by Western Gypsum Co. and U. S. Gypsum Co. will get into production during the year.

Numerous established firms in the area are in process of carrying out or are planning expansions.

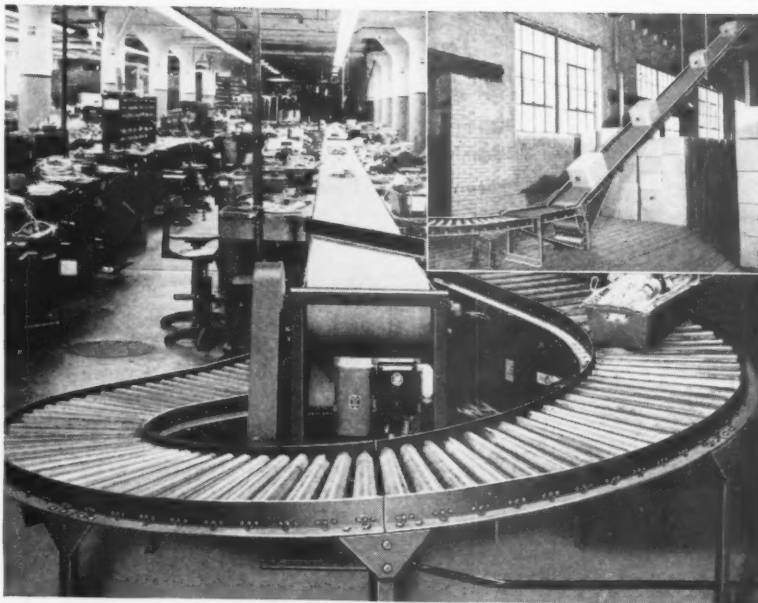
METAL MINING: The demand for non-ferrous metals should keep this industry to its 1947 level, or higher.

COAL MINING: The market for bituminous coal has been running ahead of production all year. With the railroad car supply easing somewhat, the prospects are that this industry will increase employment and production during 1948.

Purchase of the war surplus Kalunite plant in Salt Lake City by J. R. Simplot, Idaho industrialist, promises a new fertilizer industry with attendant developments to supply the raw materials. The American Smelting & Refining Co., for example, has already announced plans to increase its sulphuric acid production by 150 per cent at a capital investment cost of between \$3,000,000 and \$4,000,000.

Even if opposing bidders for the Kalunite plant successfully challenge the sale to Simplot, the area is slated to have a new fertilizer industry, for American Potash & Chemical Co. (which plans to protest the sale) would use it for the same purpose.

All of these projected developments, and others which have not been publicly disclosed, add up to a substantial increase in industrial employment during 1948 unless the country suffers an economic fall. And with industry and agriculture on the upgrade, wholesale and retail trade and service industries are not likely to deteriorate.



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LABOR

and the
INDUSTRIAL WEST

All Quiet on Western Labor Relations Front

LABOR and management in California reached a new high in industrial stability during 1947, according to records of the California Conciliation Service, a division of the California Department of Industrial Relations, Paul Scharrenberg, director.

Strikes and work stoppages are at a low tide, and in San Francisco alone, the record has reached the low of 1942, and is 40 per cent under the yearly average of 22 strikes for the eight years beginning in 1940.

There are on file approximately 75 cases to be heard before the state mediation board, due to the low labor dispute cycle. These cases come from all over the state from Eureka to San Diego, with Kern County seemingly the most restless. Kern

County is the home of the famed Di Giorgio Ranch, which is now on strike. The National Farmers Union, which covers the agricultural industries, asked for conciliation services, but the Di Giorgio management refused to mediate, and the result is a 19½-mile-long picket line on the 20,000-acre ranch. The AFL Teamsters have joined the NFU, which means that the forthcoming potato crop will be imperiled unless some agreement is reached. The farming industry is not covered by the National Labor Relations Board, but the state conciliation service could mediate, if both parties agreed.

Di Giorgio Fruit Corporation has evicted workers who lived in company houses, and

has hired San Joaquin Valley transients and workers from Texas and Mexico.

In other parts of Kern County as well there is labor unrest. The ice companies, railroad companies, teamsters, oil industry and building trades are either in the process of organizing, or if organized, are dissatisfied with their contracts.

In southern California, among pending labor disputes is that of the Los Angeles Provision Drivers Union, AFL, local 626. The normal renewal of contract time is March 1, and this organization has indicated that it was unable to arbitrate about its contract. A strike of this union will affect small processors of meat and every retail meat establishment in the area.

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Keep Records to Keep Out of Trouble

Employers who fail to maintain their wartime diligence in keeping employee records required by the Wage-Hour Division of the Department of Labor are laying themselves wide open for serious trouble, according to M. J. Muckey of the Industrial Conference Board, Tacoma.

"At the end of the war many employers discontinued much of the record keeping required by the government. It now appears that some were overzealous in their housecleaning and may have discontinued vital employees records still required by the Wage-Hour Division of the Department of Labor. Basically, the Wage-Hour Law provides a 40c minimum hourly wage, time and one-half after 40 hours worked in any one week, and prohibits production of goods by children under 16 years of age. In order to check on compliance with these requirements, the Act provides that employers maintain comprehensive records for each employee engaged in interstate commerce, or in work so closely related to it as to form a true part of it. *Failure to keep such records is punishable by both civil and criminal penalties.* Further, should an employee bring charges of violation, the burden of proof rests on the employer. Adequate records are your only defense. Otherwise, the employer pays double the wages claimed as unpaid, plus costs and attorney fees. It has been said that without proper records you can be persecuted as well as prosecuted.

I. These are the Wage-Hour records required for each employee covered:

1. Full name as shown on social security card and company number, if any is assigned and used on the payroll, time cards or other records.
2. Home address. (The employer is required to keep this up to date.)
3. Date of birth, if under 19 years of age. (If in doubt, require a birth or work certificate.)
4. Specific title of his job.
5. The time and day his work week starts and ends. (If all employees have the same working schedule, a single notation is sufficient. Separate notations would then be necessary only for watchmen, clean-up men, etc., whose working schedule varies from the regular one.)
6. Regular hourly rate of pay when overtime is worked and basis on which wages are paid. (Hourly, weekly, monthly, etc.)
7. Time the employee started and stopped work each day. Total hours for each day and for each week. (Overtime is not required after 8 hours in one day, but is required after 40 hours in any one week. Each week is considered separately. Two weeks in the same pay period can be averaged only by giving time off at the rate of time and one-half and then only if employee works a reg-



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All Quiet on Labor Relations Front

(Continued from page 81)

- ularly scheduled work week. Thus, if one hour extra was worked the first week of the pay period, one and one-half hours could be taken off the second week.)
8. Total daily or weekly straight-time earnings including piecework and commissions. (The overtime premium should not be shown, but the straight-time for the overtime hours should be included.)
 9. Total weekly overtime excess or premium compensation. (The amount over and above the straight-time earnings for overtime hours—usually one-half time.)
 10. Total additions to or deductions from wages paid in each pay period.
 11. Total wages paid in each pay period.
 12. Date of payment of wages and pay period covered.

II. Exemptions:

Executive, administrative, professional, local retail employees and outside salesmen are exempt from items 7, 8, 9 and 10 above, and that information should not be shown for these employees. In item 6 only the basis on which wages are paid should be shown. However, *all* of the other items are required for these employees.

III. Time requirement:

1. All of the above records must be kept for a period of four years from date of last entry, and must be made accessible to an inspector on demand. In addition, any notices received, union agreements and other supplemental data must be kept for four years.
2. The following must be kept for a period of two years, after date of last entry:
 - a. Employment records.
 - b. Order, shipping and billing records.
 - c. Wage rate tables.

Many Jobless In Films

Employment among screen actors is at the lowest ebb in the history of the film industry, according to President Ronald Reagan of the Screen Actor's Guild.

Out of a Guild membership of 8,500, only 600 are under contract to studios. Proportionately that represents the largest unemployment in any industry in the nation. Studios producing 50 pictures a year before the war, now are turning out about 18.

Mr. Reagan attributed much of the blame for the actors' economic straits to greatly increased theater attendance and failure to construct additional theaters, with the result that films are held for longer runs and there is less need for new pictures.

Labor Outlook For 1948

Here is the way the labor situation in 1948 looks to one forecaster of labor events:

(1) Reuther's rout of the communists in UAW-CIO is of major significance. It places that union alongside the anti-communistic steel, clothing, textile and ship-building unions, all of which are large. The CIO left wing is now relatively reduced in importance, the principal unions being smelter, fur, longshore, food and furniture.

This means less left wing influence in CIO top circles. It probably does not mean less labor turmoil. Reuther may feel that he has to deliver his pet promises: Employer financed social security, guaranteed work week, uniform wage rates, pensions, industry-wide bargaining, etc.

(2) Probably no change in the Labor-Management Act.

(3) Some changes in Wage-Hour Act. Minimum wage may go to 65c, possibly higher. Other changes in the making, but Truman may veto.

(4) Wage controls will not be tried again.

(5) Many headlines but no action from Hartley's Labor Committee.

(6) Labor will spend millions to repeal the L-M Act. Court tests of the provisions prohibiting unions to spend for political purposes will come too late to prevent them from doing so.

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Now, after long, careful development, Ready-Power is available for Motorized Hand Lift Trucks. In Ready-Power Model "Z" Units, specially developed for this service, all the features of Ready-Power become available for the users of these small, hard working material handlers.

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THE WEST ON ITS WAY

ARIZONA

AIRCRAFT PLANT TO BE RESTORED—Formal request for complete restoration of the Goodyear aircraft modification plant 17 miles west of Phoenix has been made by the 11th Naval District to the Naval Bureau of Aeronautics. Both the plant and the air field are involved in the request.

AVIOLA RADIO TO SELL—Aviola Radio Corp. have terminated all manufacturing activities and are seeking to sell or lease their plant in Phoenix, which contains 145,000 sq. ft. of space. Manufacturing operations of Premier Metal Products Corp., which have been carried on at the plant, will be moved to Los Angeles.

CALIFORNIA

ALCOA PLANT SOLD TO COLUMBIA STEEL—The vast Aluminum Corp. of America plant near Torrance has been sold by WAA to Columbia Steel Corp. for \$4,181,000. Columbia plans to spend an additional \$30,000,000 to convert the plant into a cold rolled steel manufacturing plant. The new mill will further process hot rolled steel coils produced at other existing plants into sheet steel. Plant cost the government \$25,000,000.

KAISER PIPE MILL IN OPERATION — Henry J. Kaiser's new \$7,000,000 pipe mill has begun operations at Fontana. It has a capacity of 145,000 net tons of black and galvanized pipe a year.

STEEL FABRICATOR BUYS RICHMOND PLANT—Butler Manufacturing Co., Kansas City, Mo., have purchased a factory building at Richmond from the Santa Fe Land Improvement Co. and have leased the 12½-acre site on which it stands. Buildings provide 179,000 sq. ft. of floor space to be used in fabricating steel. Steel buildings will be the first product to be manufactured. The facility was built in 1944 by Kaiser Industries as part of the shipbuilding yards. Butler operations will soon represent an investment of a half million dollars and will begin immediately. Paul M. Shoemaker will be Richmond Division mgr.

DETROIT STEEL EXPANDING AT EMERYVILLE—Detroit Steel Products Co. are building a \$150,000 addition to their plant at Emeryville, which will increase floor space by 21,600 sq. ft. and step up present manufacturing and warehousing facilities by some 40 per cent.

BARR FOODS SOLD—Barr Foods, Inc., Oakland, specialty food packers, have been purchased by a group of four California food processors. The name of the Oakland firm has been changed to Granny Goose Foods. Deal consisted of the purchase of all outstanding stock in the operation at an undisclosed price. Purchasers are M. E. Wangenheim, M. E. Wangenheim, Jr., P. K. Wanger and Henry J. Collins, Jr.

STANDARD OIL TO EXPAND AT BAKERSFIELD—A \$7,500,000 construction program to expand and modernize their Bakersfield refinery has been announced by Standard of California. New units planned include the latest in crude distillation and cracking facilities, an office building and laboratory and modern auxiliary equipment. Capacity will be almost doubled to a crude run of 20,000 bbls. daily. Construction is to start this spring with completion anticipated by mid-1949.

CHAIR FIRM LOCATES IN CULVER CITY—Capitol Chair Co., Inc., are installing machinery in a 12,000 sq. ft. building at 3578 Hayden Ave., Culver City, for the manufacture of platform rockers and occasional chairs. Sol Nissenson is president.

PROCTOR & GAMBLE EXPANDING—Proctor & Gamble Manufacturing Co., 1601 W. 7th St., Long Beach, have begun a major improvement program to include equipment replacement and installation of a hydrolyzer, a tower for manufacture of its new product "Tide," and other new features.

MILLION DOLLAR EXPANSION FOR WILLYS-OVERLAND—Willys-Overland Motors, Inc., 6201 E. Randolph St., Los Angeles, will invest \$1,000,000 in plant equipment for production of passenger automobiles and trucks. J. J. Welker is general manager of the West Coast Division.

SWINGSPOUT COMPANY BUILDING—Swingspout Measure Co., 3071 E. 12th St., Los Angeles, are constructing a 25,000 sq. ft. building at 1538 Esperanza St., to be ready for occupancy May 1. Company makes oil measures, drainers and dispensing devices for sealed oil cans.

ADHESIVE LABEL PLANT SLATED—Avery Adhesives, 458 E. Third St., Los Angeles, have purchased some three acres at 1616 S. California

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Identify dealers or service at the point of sale or use. Meyercord Decals are washable, durable—last for years.

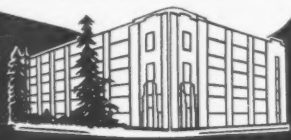
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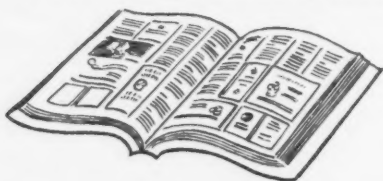
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THE WEST ON ITS WAY

St., Monrovia, where they will build a 20,000 sq. ft. plant for manufacture of adhesive labels.

ADOBE BRICK COMPANY EXPANDS—Extru Adobe Brick Co., Inc., have purchased six acres of land and two buildings at 1505 Imperial Highway, Norwalk, for expanded production of adobe bricks. Henry A. Lee is president.

DU PONT BUILDS LAB—E. I. duPont DeNemours Co., Electrochemicals Division, have built an automotive fuel testing laboratory and an automotive repair shop at El Monte.

CLOTHING FIRM MOVES—A-1 Manufacturing Co., makers of men's clothing, have moved to 1049 S. Los Angeles St., Los Angeles, where 30,000 ft. are available in a three-story building.

INCINERATOR MAKERS MOVE—Biltrite Incinerator Co. have moved to 1401 S. Alameda St., Los Angeles, where 30,000 sq. ft. are available for manufacture of domestic, commercial, and industrial incinerators.

AIR CONDITIONERS TO BUILD PLANT—Airfan Engineering Co., 833 S. San Pedro St., Los Angeles, have plans for a 21,000 sq. ft. plant in the 7000 block on Anaheim-Telegraph Rd., Montebello, where they will make air conditioning equipment.

ACME BLOWER AND PIPE MOVING—Acme Blower & Pipe Company, Inc., expect early occupancy of their new plant at 5419 Tweedy Blvd., South Gate, where over 18,000 sq. ft. are available for manufacture of industrial incinerators, dust collecting systems, conveyors and paint spray booths.

BOLT AND NUT MAKERS ADD TO PLANT—Russell, Burdall & Ward Bolt & Nut Co., 4466 Worth St., Los Angeles, plan a 14,000 sq. ft. addition for storage and pickling purposes.

CAN MACHINE COMPANY ADDING TO PLANT—Angelus Sani-tary Can Machine Co., 4900 Pacific Blvd., Los Angeles, are constructing a 12,000 sq. ft. addition for production of can closing machines.

NEW PLANT IN PACOIMA—Automatic Control & Equipment Co. are planning to build a 10,500 sq. ft. building at 12169 Montague St., Pacoima. Present location is at 5410 San Fernando Rd., Glendale.

HEATER MANUFACTURERS MOVE—The Firan Co., 1735 Berkeley St., Santa Monica, have moved to this new location where over 10,000 sq. ft. are used in making a portable infra-red electric room heater.

VANILLA FIRM TO GET NEW HOME—Standard Vanilla Co. are constructing a 10,000 sq. ft. building at 3131 N. Main St., Los Angeles, where they will move about the middle of March. Company makes vanilla extract and powdered vanilla.

KIMBERLY CORPORATION TO MOVE—Kimberly Corporation have purchased a 10,000 sq. ft. building in the Culver City Industrial Tract, where they will move shortly. They make ball-point fountain pens.

SPRING COMPANY EXPANDING—Modern Spring Co., 1824 E. 58th Place, Los Angeles, are building an 8,100 sq. ft. addition for production of coil springs for mattresses and upholstered furniture.

GENERAL CAN GETS TWO NEW BUILDINGS—General Can Co., 1275 Riverside Drive, Los Angeles, have constructed two buildings at 2425 Cabot St., one containing about 3,700 sq. ft., and one of over 4,000 sq. ft. Company makes tin cans and containers.

ALUMINUM CONTAINER CORPORATION OPENS PLANT—Aluminum Container Corp., whose offices are at 417 S. Hill St., Los Angeles, have established a plant in Castaic for production of 55-gallon aluminum drums for asphalt export, and expect to make aluminum barrels and drums. Harry A. Pines is president.

NORTHROP GETS CONTRACT FROM BOEING—Northrop Aircraft, Inc., have been awarded a \$1,500,000 contract by Boeing Aircraft Corp. for B-50 bomber landing flaps.

SPECIALTY PACKERS GET ARMY CONTRACT—F. W. Boltz Corporation, Los Angeles specialty packers and dehydrators, have been awarded an Army contract for 20,000,000 lb. of processed cereal, including wheat, soybean and corn meal. It will be handled at the Hanford, Calif., plant. Value was set at \$1,000,000.

GREETING CARD FIRM MOVES WEST—Gartner and Bender, Inc., manufacturers of greeting cards, are opening a new branch plant in Burbank at 2400 Hollywood Way, where space has been leased from the Lockheed Employees Recreation Club. About 50 persons will be employed locally. Headquarters of the firm are in Chicago. P. A. Bickley will be local plant manager and John O'Donnell local sales manager.

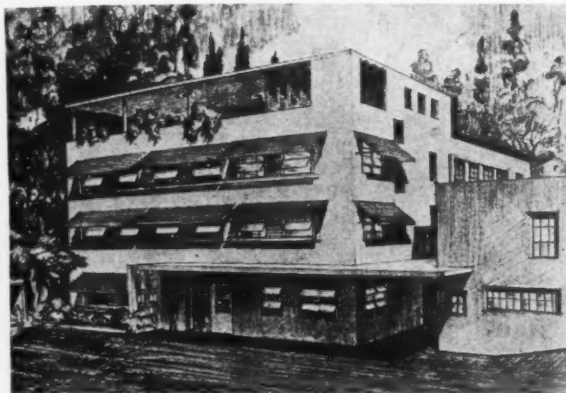
PG&E GET FEATHER RIVER PROJECT UNDERWAY—Preliminary work is underway on Pacific Gas and Electric Co.'s giant tunnel project at their \$61,800,000 Feather River hydroelectric development. T. E. Connolly, Inc., San Francisco, have been awarded the contract for 17,800 ft. of 26-ft. horseshoe tunnel, all of which will be driven through solid granite. It is estimated that more than 500 men will be employed on this portion of the tunneling work.

OAKLAND GETS AIRPORT FROM GOVERNMENT—War Assets Administration has accepted the application of the City of Oakland for return of its municipal airport, with improvements which cost the government \$2,229,757. The improvements all go to the city without charge. The city has operated the 1,159-acre airport on an interim permit, pending final settlement, ever since the Army relinquished control.

RHEEM EXPANDS AT SOUTH GATE—Rheem Manufacturing Co. is expanding office and warehouse facilities at its South Gate plant, adding 4,000 sq. ft. of office space and 24,000 sq. ft. of warehousing.

KAAR ENGINEERING DOUBLES PLANT SPACE—Kaar Engineering Co., Palo Alto, largest manufacturers of radio-telephones in the West, have plans to double plant area by purchasing the buildings of the Briarwood Corp., also in Palo Alto. This will add 20,000 sq. ft. Briarwood will continue to occupy part of the premises, consolidating their operations into about 13,000 sq. ft. leased from Kaar.

ADDITION COMPLETED—National Technical Laboratories, South Pasadena, have completed a four-story, 27,000 sq. ft. addition to their offices and plant at a cost of over \$300,000. The company makes Beck-



man pH instruments, spectrophotometers and other advanced control equipment. This is the fourth building of the company in South Pasadena.

HEATING EQUIPMENT FIRM EXPANDS—Heating Equipment Co., 600 Indiana St., San Francisco, have purchased 25,000 sq. ft. for a \$275,000 expansion of their oil and gas heating equipment plant. This will increase capacity 30 per cent and create about 80 new jobs.

ADDITION TO LITHOGRAPH PLANT—Independent Lithograph Co., 16th and Harrison, San Francisco, have plans for a \$200,000 second floor addition and new equipment.

PACKAGED REFRIGERATION COMPANY OPENS—Super Ice, Inc., have opened their new \$150,000 plant at 334 Magnolia St., Oakland, where they are making a new type of packaged refrigeration for shipping perishable commodities. They are employing 25.

MILLION DOLLAR REMANUFACTURING PLANT AT SACRAMENTO—Western United Lumber Manufacturers, Inc., 1122 Eye St., Sacramento, are planning construction of a \$1,000,000 remanufacturing plant with capacity of 400,000 ft. per day to include a planing mill, box shook factory and lath mill.

NEW PIPE MILL FOR BASALT—Basalt Rock Co., Napa, are spending \$750,000 in expansion which includes a new pipe mill.

SOUTH CITY PLANT MOVING—Goodrich Manufacturing Co., Bayshore and Underpass, South San Francisco, have begun construction of a 24,000 sq. ft. factory building to cost \$100,000. They will move their present building at 1834 McKinnon Ave., San Francisco, to a new site. They make coffee brewing equipment.

BREWERY EXPANDING—Wieland's Brewery, 1025 Cinnabar St., San Jose, have awarded a contract for their \$350,000 expansion program.

AUTO-LITE COMPANY TO BUILD PLANT AT CLEARWATER—Electric Auto-Lite Co., Toledo, Ohio, have announced plans to build a storage battery manufacturing plant at Clearwater on Compton Blvd., east of Garfield Ave. Construction of the 80,000 sq. ft. plant is scheduled to get underway shortly, and production is slated to start by the third quarter of 1948.



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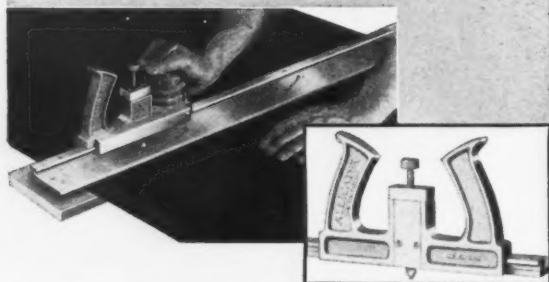
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THE WEST ON ITS WAY

***STUART OXYGEN COMPANY SOLD**—Stuart Oxygen Co., with plants in San Francisco, Los Angeles, Oakland and Hanford, has been sold to Liquid Carbonic Corp. of Chicago, involving a stock exchange of more than \$2,000,000. Stuart is one of the largest makers of compressed gasses on the Pacific Coast. It will continue to operate under its present name.

PLASTIC HOUSES—Southern California Homes, Inc., is a new firm located at 4900 Cecilia Ave., Bell. Company makes houses of plastic resinous base, and aluminum exterior. Trade name is "Lumicomb." R. S. Fleet is president.

FURNITURE MAKERS IN NEW SHOP—Provincial Furniture Shops, 2101 South Sepulveda Blvd., Los Angeles, have constructed a 12,500 sq. ft. building for manufacture of non-upholstered dining room, living room, and bedroom provincial furniture. George Murdock is owner.



*** Chevrolet's new plant at Van Nuys, in the hot San Fernando Valley.** All windows are equipped with vertical concrete louvers to keep building cool and prevent glare of direct sunlight. Plant was designed by architectural offices of Parkinson, Powelson, Briney, Bernard & Woodford, with Albert Kahn, Associated Architects and Engineers, Inc., as consultants.

BROOKLYN PLANT OPENS LOS ANGELES BRANCH—Speba Products Manufacturing Co., Inc., Brooklyn, will open a branch manufacturing plant at 2017 S. Granville Ave., West Los Angeles. Company makes brewers' specialties and winery supplies such as tank coatings, brewers' enamels, beerstone remover. George B. Smigel is owner.

WHAT'S NEW IN LOS ANGELES—Mitchel Textile Corp., 127 E. Ninth St., are making women's blouses and lingerie. Some 30 machines are in operation. . . . International Rectifier Corp., 6801 Victoria Ave., have begun production of selenium rectifiers. . . . Monarch Paint & Varnish Co., 1154 Chico Ave., El Monte, are making paint and varnish. . . . Biltmore Press have moved here from Rochester, N. Y., where they were known as Seneca Press, and are setting up shop at 5166 W. Jefferson Blvd. for job printing and trade press work. . . . Sherrill Enameling Co. are doing porcelain enameling at 2535 Cortada St., El Monte. . . . Stevenson Tool & Die Co. have begun production of dies and tools at 1245 1/2 S. Seaman Ave., El Monte.

MILLION DOLLAR PLANT FOR REPUBLIC SUPPLY—Republic Supply Co. of Calif., 2122 East Seventh St., have acquired 14 acres at the corner of Eastern Ave. and Sheila St. in the central manufacturing district where they will build a plant to cost around \$1,000,000. Firm is manufacturer and jobber of oil well and industrial machinery.

INSULATION MAKERS GET SITE FOR EXPANSION—H. I. Thompson Co., 1733 Cordova St., Los Angeles, makers of "Thermo-Cousti" and "Re frasil" fiberglass blankets and aircraft insulation products, have purchased part of the building at 611 South Redondo Blvd., Inglewood. New location will be occupied about May and will afford 50,000 sq. ft. for manufacturing purposes, and 117,000 sq. ft. of land for future expansion.

PRODUCTION EXPANDED—Vegetable Oil Products Co., Inc., 410 S. Avalon Blvd., Wilmington, have installed additional storage tanks for copra, and additional equipment to increase by one-third production of crude and refined coconut and balassa oils, refined and hydrogenated palm, cottonseed, salad oil, oleomargarine, and copra meal.

NEW BUILDING FOR EXPANSION—Reliable Manufacturing Co., makers of poultry equipment, have constructed a 40,000 sq. ft. building at 3520 Medford St., Los Angeles, for expanded production.

RHEEM TO EXPAND AT SOUTH GATE—Rheem Manufacturing Co. will expand facilities at their South Gate plant by adding 4,000 sq. ft. of office space and a warehouse building of 24,000 sq. ft.

MOTOR PRODUCTS MOVE—Motor Products Manufacturing Co. have moved to 711 South Redondo Blvd., Inglewood, where they have 26,000 sq. ft. of floor space for production of universal joints for automobiles and trucks.

MORE SPACE—Float-In-Ez Co., makers of upholstered furniture, will add some 20,000 sq. ft. to their plant at 9830 Bellanca Ave., Los Angeles.

NEW PLANT FOR PACKERS — Harman Packing Co., 3305 East Vernon Ave., Los Angeles, meat packers, will build an additional plant at the corner of Packers Ave. and Alcoa St., to contain some 15,000 sq. ft.

TWO-STORY ADDITION—C. B. Van Vorst Co., makers of mattresses and box springs, are building a two-story addition of about 15,000 sq. ft. at 600 South St. Andrews Place, Los Angeles.

LOS ANGELES' EXPANDING PLANTS — Pacific Guano Co., a 14,400 sq. ft. addition at 4522 Worth St. . . Sinclair Paint Co., a 13,000 sq. ft. addition for offices and warehouse at 901 East 61st St. . . Lacquer-Graph Process Co., a 12,000 sq. ft. building at 3201 South Broadway. Firm makes decals, display cards, does silk screen processing, with headquarters at 2812 South Main St. . . Coca-Cola Bottling Co., a 10,000 sq. ft. bottling plant at 1122 Scott Rd., Burbank. Headquarters at 1334 South Central Ave. . . Burdette Trailer Co., a 9,600 sq. ft. building at 3860 West 139th St., Hawthorne. Headquarters at 8472 South Figueroa St. . . American Recording Chart Co., a 9,000 sq. ft., two-story addition at 3111 East 11th St. . .

CHILDREN'S CLOTHING FIRM ORGANIZED—Childhood Interests of California, Inc., is a new firm just incorporated to manufacture children's wearing apparel, located at 327 State St., Santa Barbara. Roy E. Gammill is president; Harry E. Miller, vice-president; and Presley Lancaster, Jr., secretary-treasurer.

BERKELEY FIRM GETS MILLION DOLLAR CONTRACT—George E. Swett Co., San Francisco engineering firm, have contracted to have Production Engineering Co., Berkeley, make \$1,000,000 worth of Watrola water heaters during the coming year. They have arranged for distribution of the heater by Grinnell Co. of the Pacific. Announcement of the contract came after the acquisition of manufacturing rights to the Watrola by the Swett Co. Initial production, scheduled to get under way in the spring, will be centered on water heaters for radiant heating purposes. Later will come production of instantaneous hot water heaters. Patents on the heater are held by Otto Hahn, San Francisco consulting engineer.

NEW LAB FOR POMONA COLLEGE—Pomona College has established a high pressure catalytic laboratory, set up with funds given the school for this purpose in memory of a war veteran. The lab will be used for the study of heterogeneous catalysis under extremely high pressures and temperatures.

AMERICAN THREAD BEGINS CONSTRUCTION — American Thread Co.'s new plant at Apparel City, San Francisco, has been started, with completion set for July 1. The plant will occupy 40,000 sq. ft. and will cost \$250,000.

PAINT FIRMS MERGE—The Johnston Paint Co., San Francisco, have merged with their factory in Los Angeles to form the Pervo-Johnston Paint Co. Officers of the new corporation are T. P. Johnston, pres.; Henry DeRuiter, vice pres.; G. Ellis, treas.; and L. E. Bone, sec.

NEW WAREHOUSE FOR PAPER COMPANY—Crown Willamette Paper Co., 2945 E. 12th St., Los Angeles, are building a 55,000 sq. ft. warehouse. Company makes fruit wrappers, paper napkins, grocery bags, and other paper production.

CINECOLOR CORP. TO SPEND \$100,000—Cinecolor Corp., 2800 W. Olive Ave., Burbank, processor of colored films, will put up an office building to contain a projection room costing around \$100,000.

PUREX CORP. BUILDING WAREHOUSE—Purex Corp., Ltd., makers of bleaching compounds and drain openers, are building a 42,000 sq. ft. warehouse at their plant at 9300 Rayo Ave., South Gate.

NEW BUILDING FOR STEEL COMPANY—Warman Steel Casting Co., 6100 S. Boyle Ave., Los Angeles, are constructing a three-story building to contain about 36,000 sq. ft.

MILLING COMPANY EXPANDING—Sunset Milling & Grain Co., 417 S. Clarence St., Los Angeles, have begun construction on an 18,600-sq. ft. addition. The new address will be 401 E. Fourth St. Company is a subsidiary of Colorado Milling & Elevator Co., Denver.

RUSSELL BOLT ADDS BUILDING—Russell Bolt & Manufacturing Co., 800 E. Gage Ave., Los Angeles, have added 15,000 sq. ft. for production of steel cap screws, rivets and nuts.

ENLARGED QUARTERS FOR FURNITURE MAKERS—Karp Furniture Manufacturing Co., 1023 E. Adams Blvd., Los Angeles, have leased a 15,000-sq. ft. building for increased production of modern living room and dining room suites and occasional furniture. The original plant at 779 Towne Ave. will also be used.

PLANT ADDITION FOR CALIFORNIA INK—California Ink Co., whose offices are at 1136 Maple Ave., Los Angeles, will construct a 13,000-sq-ft. additional to their plant at 2939 E. Pico Blvd., for manufacture of printing and lithographing ink, printers' rollers, photo-engraving and photo-litho supplies.

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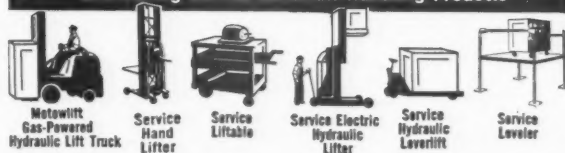
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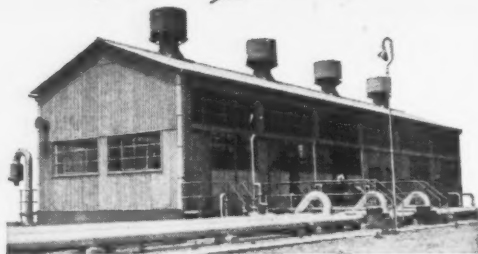


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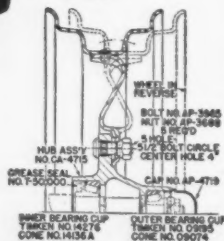
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THE WEST ON ITS WAY

NEW PLANT DUE FOR CAL PIPE AND STEEL—Southern California Pipe & Steel Co., 9101 S. Alameda St., Los Angeles, have bought five acres at 11949 South Alameda St., where they are putting up three buildings for making steel fencing, posts and gates. New quarters will contain about 12,000 sq. ft.

SPRINKLER COMPANY ADDS DEPARTMENTS—Curtis Automatic Sprinkler Co. have added a pipe threading and cutting department to their 10,000-sq. ft. plant at 5533 Long Beach, Ave., Los Angeles.

REFRIGERATION FACILITIES TO BE ADDED—Bissinger & Co. are adding a refrigerated basement to their plant at 2421 E. 16th St., Los Angeles, and new equipment for processing hides and skins, tallow and wool.

ADDITION FOR SMOKING & CURING COMPANY—Los Angeles Smoking & Curing Co., 778 Kohler St., are building a 9,000-sq. ft. addition for spicing and pickling herring, smoking salmon, shad, white fish and herring.

NEW HOME FOR GIFTWARE COMPANY—California Giftware Co. have moved to new quarters at 2154 Hyde Park Blvd., Los Angeles, where some 9,000 sq. ft. are available for manufacture of plastic, wood, and metal items and display fixtures.

CABINET COMPANY TO INCREASE PRODUCTION—In order to increase production of their line of kitchen cabinets and custom mill work Craftbuilt Cabinets, 200 S. Victory Blvd., Los Angeles, will build a 9,000-sq. ft. addition to their plant.

PRINTING HOUSE ADDS SPACE—Stuart F. Cooper, 2201 Compton Ave., Los Angeles, have made a 7,500 sq. ft. addition to accommodate a larger volume of printing, and increased production of such items as receipt books and gummed labels.

ENGINEERING FIRMS MERGE—California Steel Treating, Inc., and Doran Engineering Co. have merged to form California-Doran Heat Treating Co., with headquarters at 2850 E. Washington Blvd., Los Angeles. New officers are R. P. Archer, pres.; R. C. Sherwood, vice-pres.; Glen L. Brock, sec.; and Frank M. Robison, treas.

OVERALL FIRM LOCATES IN PASADENA—Cleveland Overall Co., Cleveland, Ohio, have established a branch at 41 E. Union St., Pasadena. About 30 machines will be used in making men's overalls. Norman Wood is in charge.

OAKLAND FIRM MOVES SOUTH—Whitaker Cable Corp. have moved from Oakland to 320 W. 14th St., Los Angeles, where they are making automotive cable products of wire. These products include battery cable, ignition sets, automotive loom assemblies, aircraft bonding jumpers. C. C. Case is West Coast manager; L. E. Williams, district manager; and Lloyd Evans, production manager.

CASKET COMPANY BUILDING—Westwood Casket Co. are building a 10,000-sq. ft. plant at 1815 Flower St., Glendale, for manufacture of caskets.

FROM DENVER TO GLENDALE—Insulation Products & Manufacturing Co. have moved from Denver to a plant at 433 W. Magnolia Ave., Glendale. Company makes "Insul-Wool," and is owned by Arthur W. Hall.

POWER TOOL FOR SPEEDY REPAIRS BEING MADE—A new San Diego county manufacturing concern, the International Tool Corp., is now in production of a new hydraulic power tool designed to speed up motor repair service. The firm is now producing 50 units a month at its plant at Chula Vista and production will be stepped up to 200 a month in 1948. Firm employs 57. Robert H. Zimmer is president.

MACHINERY COMPANY PURCHASED—United Engineering Co. have purchased the Turner Machinery Co., San Francisco. United will continue production and sales of Turner machines and distribution of other machinery lines represented by Turner. Personnel, tools and other facilities will be transferred from the Turner plant to United's plant on Beale St.

GOLD MINE TO BE PURCHASED—Peckham Hill Gold Mines, Inc. are completing arrangements to buy the famed Peckham Hill drift gravel property at Forest Hill. They will recondition underground workings, improve equipment and conduct extensive exploration and development work.

NEW PAPER BOARD FIRM FOR CALIFORNIA—A new firm, the Newsom Kraft Co. of California, has been organized to manufacture kraft liner-board, corrugating medium and wall board in central California. The firm has been granted a loan of \$7,500,000 by R.F.C. and private capital is supplying the equity money to supplement the loan. Total cost of the project, which will involve erecting new mills, is placed at over \$14,000,000. Construction will start early this year and the plant is planned to be in operation by 1949, with minimum production.

tion of 500 tons a day of kraft paperboard, 500 tons of sulphate pulp and over 200,000 ft. of wallboard. The company was formed by engineer K. K. Newsom, who is pres. and general manager. Harry Jeffrey is sec.-treas.

PACIFIC PAPER CONVERTERS SOLD—Pacific Paper Converters, Inc., have sold their plant on Dumbarton Road, Redwood City, to Prudential Insurance Co. and Remington Rand, Inc. for around \$130,000. Prudential will take title to the plant, consisting of 22,500 sq. ft., and will lease it to Remington for a period of 20 years. Remington will also hold two adjoining acres for future expansion. The plant will become northern Calif. manufacturing and distribution center for the systems division of Remington Rand.

COLORADO

GASOLINE PLANT AT RANGELY—California Co., Texas Co. and Stanolind Oil & Gas Co. are planning a \$3,000,000 plant at Rangely for the manufacture of gasoline from natural gas. Planned output is 25,000 gallons a day.

PUEBLO FIRM TO MAKE CASKETS—Stephenson Wood Products Co., Pueblo, are converting to the production of burial caskets. Conversion was to be completed, ready for limited production during January.

STEEL EQUIPMENT COMPANY BUILDING—Steel City Supply and Equipment Co. are building a \$250,000 plant at Pueblo, for manufacture of equipment for grocery stores, bakeries, bars and hotels in the mountain states. President is M. R. Fraker.

IDAHO

BOISE FIRM MAKING RANCH GATE—The Swing-EZY-Gate Co., Boise, have begun production of a non-sagging ranch gate which is shipped to the buyer knocked down but ready for easy assembling. H. W. Stewart, Boise photographer, is the inventor.

WESTVACO TO BUILD NEAR POCATELLO—Westvaco Chlorine Production Corp. have completed arrangements for production of elementary phosphorus at an electric furnace plant near Pocatello. The first furnace is expected to be completed in 1949 by United Engineers and Constructors of Philadelphia. The plant will be designed to permit expansion. Raw phosphate ores will be fed into the processing plant from the large phosphatic rock deposits in the Fort Hall Indian reservation, some 30 miles from Pocatello. Agreement has been reached with J. R. Simplot, fertilizer manufacturer, to gain access to the phosphatic deposits on the reservation. The new plant will be adjacent to Simplot's plant. A contract for power has been signed with the Idaho Power Co.

POTLATCH PLANS VENEER PLANT—Plans to enlarge the Clearwater unit of Potlatch Forests, Inc., to enable the Lewiston mill to produce white pine veneer have been completed. The plant will add some 80 employees to the present 1,100, and will produce about 400,000 sq. ft. of veneer a day.

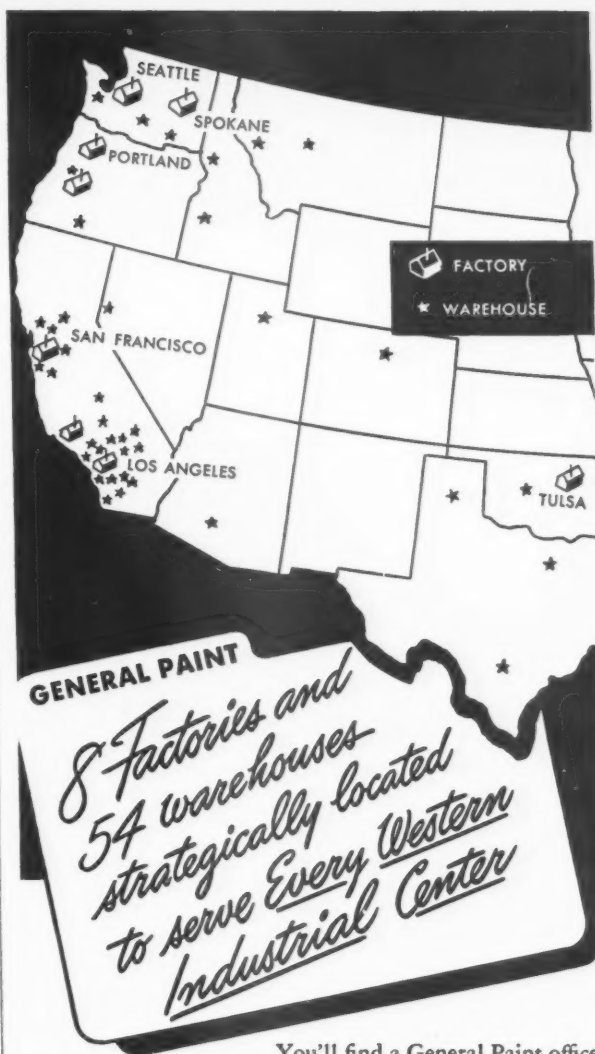
BABY FOOD PLANT AT MERIDIAN—Second SMA manufacturing plant in the country has been completed and placed in operation at Meridian by Wyeth, Inc., Philadelphia pharmaceutical firm. SMA is an infant food based on milk that is rapidly gaining popularity among pediatricians. Capacity of the Idaho plant is 300,000 one-pound cans of powder per month. The operation consumes about 1,500,000 pounds of skim milk per month. Installation of additional equipment this year will permit production of a liquid form of the same product.

LIME PROCESSING PLANT PLANNED—A lime processing plant with 15 tons per day capacity is scheduled for erection at Orofino, 45 miles east of Lewiston. Geological reports estimate that the lime rock deposits to be exploited amount to 1,500,000 tons with sufficient grade and quality to produce all lime products.

SUGAR PLANT PLANNED FOR HOMEDALE—Amalgamated Sugar Co. have authorized the construction of a new and modern sugar factory at Homedale, 15 miles east of Caldwell. Actual construction is to begin in the spring and the factory is expected to be completed in time for processing the 1949 crop.

MONTANA

PULP DRYING PLANT IN OPERATION—Utah-Idaho Sugar Co.'s new \$1,000,000 beet pulp drying plant at Chinook is now in operation, and local livestock feeders estimate that the operation will add hundreds of thousands of dollars annually in new wealth to the industry in Montana. Until now it has been economical to feed the wet sugar beet pulp only in feed lots near the Chinook factory, but the dried pulp, which is light, may be shipped for considerable distances. This means a great expansion of the lamb and steer feeder program in Montana.



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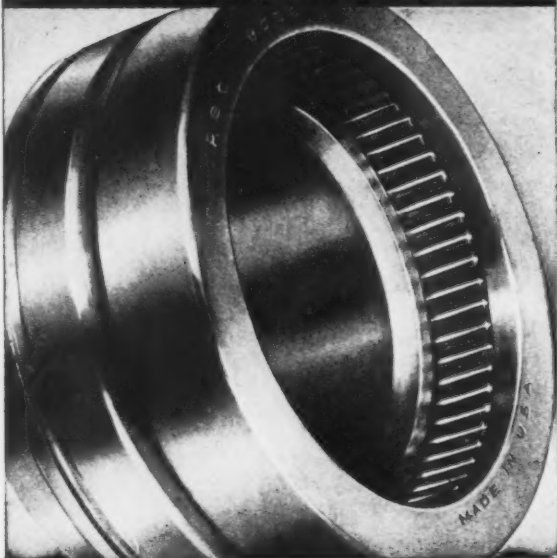
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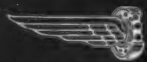


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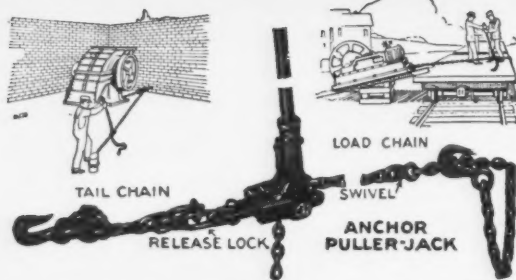
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THE WEST ON ITS WAY

BILLINGS REFINERY STARTED—Continental Oil Co. have begun construction of their \$8,500,000 refinery at their 100-acre site near Billings. Contractors are Jones & Laughlin Supply Co. of Tulsa. Work on the refinery itself has not begun, but before spring comes preliminary buildings and railroad spurs will have been built and roads on the sites graded and oiled.

MONTANA OIL FIRMS PURCHASED—Wasatch Oil Co. of Salt Lake City and the Ada Oil Co. of Houston, Texas, have purchased all stock in the Home Oil and Refining Co. and the A. B. Cobb and Co., Montana independent oil operators. The two firms owned a refinery at Great Falls, 43 bulk and service stations in Montana, some 200 wells in the Cut Bank, Pondera and Kevin-Sunburst fields, a number of proven undrilled locations, crude oil gathering systems, a pipeline, and tank farms with about 250,000 bbls. of storage. Price was not disclosed.

NORTH STAR OIL TO BUILD AT BILLINGS—An oil refinery to cost some \$250,000 will be constructed in or near Billings this spring by the newly-formed North Star Refining Co. Plant will have a capacity of from 2,500 to 3,000 bbls. a day.

FIRM EXPANDING AT BILLINGS, GREAT FALLS—Eaton Metal Products Co. have plans for expansion at Great Falls, including a warehouse and extra personnel; and at Billings, including \$100,000 worth of new buildings and loading facilities. Employment will be increased at Billings by 30 to 40 per cent. Buildings to be erected include a 100x60-ft. plant for tank fabrication and a 100x85-ft. building for making culverts. A 15-ton overhead power crane will be installed and a railway spur line built to the site. Company makes oil equipment, tanks, truck tanks, transport, culver and siphon tanks and serves the farming, mining, petroleum, and oil field trades.

NEW MEXICO

INTERNATIONAL MINERALS PLAN CARLSBAD REFINERY—International Minerals & Chemical Corp. are planning to build a new refinery at Carlsbad for the production of chemical grade muriate of potash and improved grade of potassium sulphate. Construction is to start shortly. The new plant addition will cost over \$1,000,000 and will be built adjacent to present facilities.

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OREGON

RAILROAD PLANS WAREHOUSE ADDITION—The Union Pacific Railroad Co. will construct a one-story 200x200-ft. reinforced concrete addition to the warehouse now under lease to Western Auto Supply Co. The estimated cost is \$125,000.

FISH CANNERY OPENS—The million dollar plant of the DelMar Canning Co., Warrenton, has begun operations. The new plant is claimed to be the only one on the Coast capable of packing or processing fish livers in its vitamin oil unit, and also the only firm on the Coast to build an evaporation plant which reclaims the press liquor from its reduction plant. The plant consists of 11 prefabricated sheet steel buildings containing 50,000 sq. ft. of floor space. It has a double filleting line, a three-line cannery, an 800-ton capacity refrigerated storage warehouse, laboratory, machine shop, carpenter shop and net shed. At the August peak DelMar will employ about 450 workers, not including fishermen.

PENDLETON PLANT CHANGES HANDS—John Noel, Jr., associated with his father as owner of the Yakima Pepsi-Cola Company, has purchased the bottling plant equipment of the Roesch Brewing Company, Pendleton, and has leased the building from Henry W. Collins of Portland. Noel plans to continue manufacturing carbonated beverages but does not expect to operate the brewery. William McKalip is the manager of the new plant.

LUMBER COMPANY TO IMPROVE MILL—Improvements expected to cost \$80,000 are now under way at La Duke Lumber Co. mill at Cushman. The major item in this program is the filling in of a portion of the grounds, an area of 8,750 sq. ft., with sand and crushed rock.

PORTLAND COMPANY CONTRACTED FOR "SKYHOOKS"—Pointer-Willamette Company, Portland, will install "skyhook" equipment in Arabia for the Trans-Arabian Pipeline Company, and when completed the contract may exceed \$1,000,000. The skyhook, first developed for Pacific Logging operations, will be used in Arabia to unload materials on 20,000 feet of cableway for the construction of 1,050 miles of pipeline.

DOUGLAS FIR PLYWOOD PLANT TO BE BUILT—The Portland Plywood Company has announced that they will construct a complete Douglas fir plywood plant at the foot of S. W. Mill Street, Portland, in the near future. Their total investment will exceed \$500,000. Approximately 150 men will be employed when in operation.

PORTLAND FIRM BUYS KELSO SHINGLE MILL—The Portland Shingle Company have purchased the Crescent Shingle Company plant and their timber holdings at Kelso, Washington, for \$250,000. The plant employs about 80 men. Everett Browning, Portland, will be the resident manager.

NEWPORT FIRM PLANS HARBOR WORK—The Yaquina Bay Dock and Dredge Co., Newport, will participate in harbor improvement, dock construction, and shipping, and is submitting a plan to the port of Newport commission for purchase of 41 acres of tideland and a lease of 220 acres. Frank Wade is president.

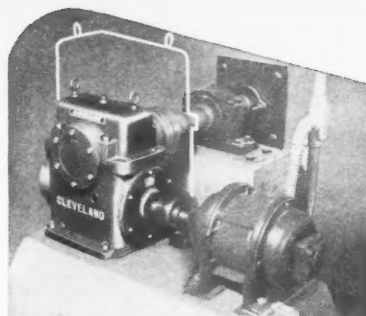
G.E. OF PORTLAND WILL BUILD—The Portland division of General Electric plan the construction of a one-story L-shaped building at a cost of \$255,000, to include a 90x142-ft. shop and a 220x115-ft. warehouse section. It is to be built in the Guilds Lake industrial area.

FERTILIZER COMPANY TO BUILD MIXING PLANT—The Oregon-Washington Fertilizer Co., Seattle, plan construction of a fertilizer factory in Portland shortly. The plant will be built on land leased from the Spokane, Portland & Seattle Railway Company. The building will be approximately 160x173 ft.; it will be of reinforced concrete and heavy mill construction. K. H. Chapman, Seattle, will handle the construction work. The new plant will be capable of handling mixing and manufacturing of chemical commercial fertilizers.

LUMBER COMPANY BUILDS PLANING MILL—The White City Lumber Co. are building a dry kiln and installing planing mill machinery at Camp White, Medford, where they have acquired 309 acres with power plant, warehouses, and railroad sidings.

UTAH

UTAH SUB-DEPOT OFFERED BY WAA—War Assets Administration is offering for sale the Army's Utah Sub-Depot at Salt Lake City, operated during the war by Remington Arms Co. Property includes 35 buildings containing about 1,000,000 sq. ft. of floor space, adaptable for industrial or commercial use. Plant occupies a 5,000-acre tract. Buildings are of modern reinforced concrete construction, the majority of which are air-conditioned and have fluorescent lighting. They are designed for heavy floor loads and machine installations on an assembly line basis.



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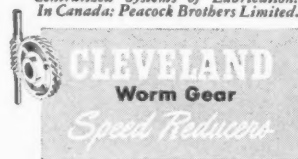
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THE WEST ON ITS WAY

KAISER BUYS IRONTON PLANTS—Henry J. Kaiser interests have purchased the iron blast furnace and coke plant at Iron-ton from WAA for \$1,150,000. When the plant is reopened it is estimated it can produce about 300,000 tons of pig iron a year, and will furnish employment for 225 workers.

SIMPLIT GETS KALUNITE PLANT—J. R. Simplot, chemical fertilizer manufacturer, has purchased the war surplus kalunite plant at Salt Lake City for \$752,000, for production of phosphoric acid and sulphate of ammonia. Remodeling, to cost between \$500,000 and \$750,000, is to begin shortly.

MOTOR MANUFACTURING FIRM INCORPORATED—Tri-Tilt Motors, Inc., is a new firm in Salt Lake City, incorporated for \$250,000, to make a newly-invented motor. The new firm promises to create a new industry in this area. R. W. LeBaron is the inventor of this new non-reciprocating rotary piston motor for air, steam or gasoline engines. The piston turns with the crankshaft in a circle with no connecting rod. It is of the compression-type, firing from both ends of the piston in a straight cylinder. Piston side thrust is eliminated. Also, the motor is claimed to be of higher speed than any other type of piston motor, but still can be operated as slowly as others. Quantity production is planned shortly. Officers of the new firm are Mr. LeBaron, pres.; Vernon Farnsworth, v. pres.; William V. Young, sec.-treas.; Adrian D. LeBaron and Ralph Clark, directors.

WASHINGTON

PLYWOOD FIRMS COMBINE—Four Grays Harbor men, Roland M. Gordon, his son, Russell H. Gordon, both of Elma, and Frank C. Ladley and son, Jas. R. Ladley, Hoquiam, have incorporated the Gordon-Ladley Plywood Co. and will begin construction of a small plywood plant at Elma. Firm is capitalized at \$140,000.

COMMERCIAL SHIP REPAIR TO BUY WINSLOW PLANT—Commercial Ship Repair, Seattle, have completed plans to purchase the historic plant of the Winslow Marine Railway & Shipbuilding Co. from James Griffiths & Sons, Inc., pioneer Seattle firm. Commercial will take over the yard immediately and begin operations. The new owners' first job in the yard will be a \$429,000 conversion job on the T-2 tanker Cossatot.

SHIPBUILDING CONTRACTS AWARDED—Contracts have been awarded for 12 all-welded steel vessels costing some \$200,000 to firms in the Pacific Northwest by various interests, reports H. C. Hanson, Seattle naval architect, who designed the craft.

VANCOUVER MACHINERY FIRM INCORPORATED—A new firm in Vancouver, Wash., the B. V. & M. Manufacturing Co., have filed articles of incorporation in Olympia listing capital of \$100,000. The firm will deal in machinery and equipment for use in paper mills. Ed Costello, principal in the firm, has developed a wrapping machine and designed a paper roll for which patent rights have been applied.

FISHING TACKLE FIRM SOLD—The Troller Tackle Co. of Tacoma has been purchased by Wise Products Co., Portland, Ore., manufacturers and distributors of fishing tackle and equipment. The Tacoma concern is being made a division of Wise Products with a view to invading the Alaska market. An increase in volume of production and payrolls is contemplated. W. B. Heil, former owner, has been brought into the Wise organization as v.p. in charge of Troller Tackle division.

AEROCAR TO BUILD—The Aerocar Associates, a Longview group organized to develop a plant for the production of a flying automobile, have completed plans for the construction of the first unit of the factory at the new Longview airport. The first unit, 50x85 ft., will house facilities for drafting and engineering personnel. Experimental quarters will also be included. This unit is to be but 1/16 of the final plant. The proposed craft is to have an automobile unit slightly larger than a Crosley, and an aircraft comparable to an air coupe. When used as a car the wings will be dismantled and carried in a trailer-type unit behind the car.

SWIFT BUYS PURITY—Swift & Co. have purchased the plant and business of Purity Ice Cream, Inc., 1809 Minor Ave., Seattle, and will begin operations immediately. Management of the Seattle plant has been assigned to R. A. Richardson.

PERMANENTE TO BUILD MILL AT SPOKANE—Permanent Metals Corp. are planning construction of an aluminum rod, bar and wire plant at Spokane. Kaiser already operates a rolling mill for production of sheet, plate and strip products at Spokane, and officials said the new wire and bar plant would be located with this plant. Plans are still in the engineering stage, and have not yet been approved by the firm.

BELLINGHAM BUYS MILL PROPERTY—The Port Commission of the City of Bellingham have purchased the Bloedel-Donovan Lumber

Mill site on the waterfront for \$75,000. Site has a waterfrontage of 1,800 ft. and is served by three railroads and ocean-going ships. Several buildings suitable for industrial use are now located on the property.

PAF BUYS FOOD PLANTS—Pacific-American Fishers, Bellingham, have gained Federal District Court approval to operate the bankrupt plants of the Polar Frosted Foods, which have holdings in Mount Vernon and eastern Washington. The Polar concern will be taken over by PAF and operated in conjunction with their other sales outlets.

TRANSAMERICA GAINS INTEREST IN PICTSWEET FOODS—Transamerica Corp. have announced an agreement with Pictsweet Foods, Inc., cannery and packers of frozen foods, giving Transamerica a minority interest in the firm. The agreement provides for Transamerica to purchase 8,250 shares of new Pictsweet 5 per cent convertible \$100 par preferred stock and for Capital Co., a Transamerica subsidiary, to turn over to Pictsweet two food freezing plants it operates at Kent, Wash., and Albany, Ore., in exchange for 1,600 Pictsweet shares. The \$825,000 Pictsweet receives from Transamerica will be used for business expansion.

EVERETT SHINGLE FIRM SOLD—Russell H. Farrington and Lester F. Garrett, Seattle, have purchased the Super Shingle Co. in Everett from J. M. Willett, owner and operator for the past 20 years. The new firm, which will be known as the Super Shingle Co., Inc., is managed by Farrington.

POWER PLANT TO EXPAND—The capacity of the Ariel hydro-electric plant, on the Lewis River near Woodland, Wash., of the Pacific Power and Light Co., will be doubled with the installation of a 50,000-kilowatt generator. Plans for this \$3,000,000 expansion program were announced by Paul B. McKee, company president. Actual installation is dependent upon maintenance of the present affiliated relationship between Pacific Power and Light Company and Washington Water Power Company.

TRUCKING FIRM BUYS PROPERTY—Consolidated Freightways have purchased property 300x300 ft. at Thirteenth and Reese, Walla Walla, where they expect to build a new freight terminal during 1948.

GROCERY COMPANY PLANS WAREHOUSE ADDITION—Roundup Grocery Company, Spokane, have contracted Roy L. Bair & Co. for the construction of 30,000 sq. ft. addition to its present warehouse to cost \$125,000. The one-floor building will be of cement block construction with reinforced concrete floors.

TRUCKING SERVICE AND WAREHOUSE PLANNED—The Pyramid Company, Seattle, have revamped the plans for a trucking service and warehouse building to be constructed for Sam Terrano, who will operate and own the business. The estimated cost is to exceed \$100,000. The two-story structure will be 200x75 ft., monolith concrete with Roman brick facing, and will contain warehouse, offices, truck repair service, and service station.

THREE SEATTLE FIRMS ORGANIZE LUMBER EXCHANGE—Bush Bros. Lumber Co., Frank C. Hansen Co., and Thompson & Greene have established offices, to be known as the Western Lumber Exchange, in Smith Tower, Seattle. This organization is the first of its kind to be formed in the Pacific Northwest timber industry. It makes available to mills a complete distribution service covering outlets throughout the United States, and it will also handle export sales. W. Frank Bush is the president of the new exchange.

FISHING FLEET FACILITIES TO BE ENLARGED—A \$750,000 development has been proposed for the Salmon Bay fishing terminal near the south end of the Ballard Bridge, Seattle, to provide facilities for the largest fishing fleet on the Pacific Coast. Four hundred fishing boats are berthed now at the terminal; this number will be doubled when 20 acres east of the present docks are developed to provide additional moorage. The first project is the construction of a \$250,000 bridge to replace the inadequate wooden structure at 15th Avenue West.

TACOMA PAPER COMPANY GETS BUILDING PERMIT—The St. Regis Paper Co. has been granted a permit for the construction of a steel and concrete building at an estimated cost of \$900,000 as the beginning of a huge expansion project on the Tacoma tideflats. This site has been selected for the kraft paper mill and multi-wall bag plant. This program will add between 500 and 600 employees to the tideflats industrial payroll when completed. The paper mill itself will require a two-story building 72x612 ft. Another two-story building, 360x364 ft., will house the multi-wall bag plant, the construction of which will cost an estimated \$1,400,000, exclusive of machinery.

WYOMING

\$100,000 WAREHOUSE AT CHEYENNE—The Wyoming Wool Growers Cooperative Wool Marketing Association have acquired a large site along railway trackage in Cheyenne and plan to start construction of a wool warehouse there this year. Cost is estimated at \$100,000. The site, 100x750 ft., is located in the west end of Cheyenne.

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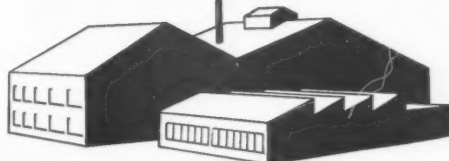


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J. E. Badgley

J. E. Badgley, formerly southern California manager for King Publications, and present secretary-treasurer of the Material Handling Ass'n of Southern California, is new sales manager of materials handling equipment division of the George M. Prescott Co., 1567 E. 25th St., Los Angeles.

J. S. Womack, newly named Western divisional manager for Glaser, Crandell Co., Chicago manufacturer of nationally advertised pickles, preserves, sauces, Chinese foods and mustard. Mr. Womack, formerly sales manager for Hunt Foods, Inc., in northern California, now has charge of all Glaser-Crandell salesmen and brokers in 11 Western states. His headquarters will be in San Francisco. For 12 years Mr. Womack was with the California Conserving Company serving in San Francisco as district manager.

The Denver Oxygen Co., 10th & Lawrence, Denver, and the E. & E. Welding Supply Co., 319 S. 37th Street, Billings, Mont., have been selected as distributors for All-State Welding Alloys Co., Inc., White Plains, N.Y.

W. C. Bennett, formerly in charge of engineering service in the St. Louis area for Hall Laboratories, Pittsburgh, has been named district engineer for the company, covering the area comprising Colorado, western Texas, Utah, New Mexico and Wyoming. He will make his headquarters in Denver with the Denver Fire Clay Co., which represents the parent firm, Hagan Corp., and its associated companies. Mr. Bennett succeeds Gerald G. Lipke, who has been transferred from Denver to the Pittsburgh sales area. . . . United Engineering Co., Portland, has been selected as Oregon representative for the Hagan Corporation of Pittsburgh, Pa., and its associated companies, Hall Laboratories, Calgon, Inc., and the Buromin Company. The Northwest Filter Company of Seattle will continue to represent Hagan Corp. and associated companies in the state of Washington. J. Rodger Sheridan is president and founder of the newly organized United Engineering Co., 6940 N. Olin Street, Portland.

Associated Research, Inc., of New York will have A. A. Barbera & Co. of Los Angeles as West Coast representatives to handle all instruments developed and manufactured by Associated, including the Vibroground, Vibrotect, Hypot, and Morse Cable Tester.

W. Bert Knight Co., Los Angeles factory representative, announces two additions to its staff. Ken Bell will handle industrial, government and specification accounts, and Wes Alderson is in charge of technical items and promotion of new accounts. Mr. Alderson will also act as liaison man for movie and radio accounts.

Ralph I. Peterson appointed San Francisco representative for U. S. Steel Co. . . . Harry A.

Winter named manager of Los Angeles office of U. S. Steel Supply Co.

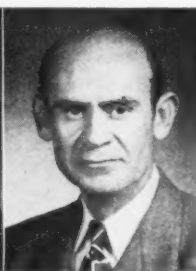
Victor A. Lervold has been promoted to market research representative of General Petroleum Corporation's Washington division, to succeed Howard G. Wallis, who has resigned to re-enter the Army as a lieutenant-colonel in the Air Corps. . . . C. A. Turney announced as manager of tire and specialty sales for General Petroleum Corp., with Clyde W. Port succeeding Turney as manager of the company's sales training department. R. C. Tucker, former manager of tire and specialty sales, has resigned.

The Northwest Furniture Manufacturers' Association have established offices in Seattle with Arthur M. Carney, executive secretary.

Joe C. Knapp, formerly business manager of the Los Angeles Branch of the White Motor Company, has been transferred to the San Francisco branch as salesman to handle the assignment formerly under Jack Lambrecht. Mr.



Joe C. Knapp



Tom N. Grizzell

Knapp's promotion is the result of more than 25 years of service with the Pacific Coast region where he has served the White Co. in many capacities. Tom N. Grizzell, who has served as credit man for the Los Angeles branch for the past five years, has been promoted to the position of business manager, succeeding Mr. Knapp. . . . It was also announced that Jack Lambrecht and Bill Crawford of the San Francisco sales department have purchased the interests of the Henwood Motor Company of San Jose and been chosen White distributors for that area. The newly formed company will be known as the C & L Motor Company.

Harvey A. Mylander has been appointed district manager for southern California and Arizona for the De Laval Steam Turbine Co., Trenton, N. J., with headquarters in Los Angeles.

Surveys, Incorporated, is a new organization in Palo Alto, California, with Dr. Keith Van Allyn, president and director of research, and J. Herman Mattson, vice-president and general manager. This firm will make available to educational and industrial organizations, placement techniques, training services, job evaluation methods, and special economic surveys.

Lloyd G. Backart named sales representative for Washington state by Rapids-Standards Co., Inc., Grand Rapids, Mich. His territory will also cover the company's upper Idaho territory.

Permanente Metals Corp., Oakland, Calif., producer of aluminum, has named Eagle Metals Co., Seattle, as its distributor in the Pacific Northwest.

J. E. Fendrick is the new member of Ira G. Perin Company's northern California sales staff. This firm are distributors of Elwell-Parker electric industrial trucks and tractors.

The Air Reduction Company has formed a new wholly owned subsidiary, the Air Reduction Pacific Company, under the direction of H. P. Etter, formerly sales manager of the Pacific Coast division. This Western subsidiary will include San Francisco, Los Angeles, Portland and Seattle. Mr. Etter will make his headquarters, Room 1813, Mills Tower, 220 Bush St., San Francisco 4, California.

Robert Alldredge and Sanford Simons, late of the Los Alamos atomic energy center, have opened an industrial research firm in Denver specializing in chemical and metallurgical engineering problems. Laboratories located at 2049 Champa Street.

Anderson-Nichols & Co. and F. D. Wallace & Associates, Inc., both with offices in Los Angeles, announce the consolidation of their engineering and industrial relations services to provide a coordinated technical service to management. Edgar A. Williams will represent the firm on the West Coast, at Suite 105, 725 S. Spring St., Los Angeles 14, Calif.

A. J. Horn succeeds the late Ralph V. Hiam as sales promotion and advertising manager of Payne Furnace Co., Beverly Hills, California.

Thermoid Co., Trenton, N. J., announces the following personnel changes: Jack Brand, formerly assistant sales manager at Trenton, will handle industrial sales for Colorado, headquarters, Denver; J. J. Chamberlain, formerly with Pioneer Rubber Mills of California, in charge of industrial sales for state of Washington and northern half of Oregon, headquarters in Seattle; E. J. Dunlap, transferred from Trenton to San Francisco to direct industrial sales for northern California and southern Oregon.

Jay Tagg, assigned to the Seattle sales office of National Electric Products Corp., Pittsburgh, Pennsylvania.

Ross Miller takes over management of Western region for Gar Wood Industries, Inc., Wayne, Michigan. His region consists of the Mountain and Pacific states, west Texas, British Columbia and Alaska. Western headquarters for the Gar Wood Industries are in San Francisco.

A. J. Wherity promoted to assistant manager of Wood Tractor Co., distributor of logging and other industrial equipment in Oregon and southern Washington.

Harvard P. Stewart named manager of marine sales for Bay Area yards, shipbuilding division, West Coast Yards, of Bethlehem Steel, succeeding John T. Greany, deceased.



John Calvert

John Calvert, appointed manager of Fruehauf Trailer Company branch at Fresno, California.

John L. MacNichol rejoined the Pacific Marine Supply Co. of Seattle as manager of engine department.

E. C. Harrison takes post of sales manager of Shell Oil Co.'s petroleum marketing on the Pacific Coast, replacing J. G. Jordan, present marketing vice-president. R. D. Stetson, advertising and sales promotion manager, becomes operations manager.

NEW METHODS, MATERIALS, EQUIPMENT

That Will Help to Cut Your Production Costs

702

All-Steel Conveyor Has Flexible Design

With an indestructible all-steel construction and extremely flexible in design, the all-steel belt conveyor, manufactured by Forbes Brothers Company, Los Angeles 21, California, is suitable for light or heavy loads as a single conveyor or as a complete conveying unit.

The steel belt conveyor may be purchased in any length which can be changed by the purchaser to whatever length is desired. It is constructed in standard five-foot sections, any of which can be removed or added to the unit.



Rugged simplicity of construction provides economy, durability, maintenance ease, safe operation, and a positive non-slip movement. A perfectly flat working surface is presented at every point. There can be no slippage, because the belt is geared to the sprocket.

In addition to the large units, the steel belt conveyor is available in a six-inch width. Other models include the "escavator," which is an all-steel inclined plane conveyor; a specially constructed all-steel belt for handling hot castings; a portable conveyor; and the equipment features two-way conveying.

703

Midget Puller Has Safety Factor

A small midget puller designed to pull or lift 500 pounds, and featuring a safety load handle, has been recently introduced by an Illinois firm. The tool is designed to save time and eliminate back-breaking effort of men on lifting, pulling or stretching jobs. With a rated capacity of 500 lbs.,

its chain has a tensile yield of 2,000 lbs. and its snap hooks a tensile yield of 3,000 lbs.

The safety load handle will bend at about 800 lbs., a level well below the yielding point of any other part of the puller. Weighing only 6½ lbs. with chain, this midget puller features a two-way handle that can be used as a high speed crank or a ratchet lever. Bulletin MP-1, Coffing Hoist Co., Danville, Ill. Evans Associates Co., Chicago 1, Ill.

704

Something New In a Booster

Said to be a radically new conveying unit, a portable belt conveyor booster is now on the market. This unit is capable of being fed or discharged from either end, and its angle or height is instantaneously adjusted by hydraulic power.

It has two floor locks and a push button off and on switch. Known as Styl-O-Veyor portable belt conveyor booster, it is manufactured by the Island Equipment Corporation, New York City 17, N. Y.

705

Metal Powder Presses In Product Manufacturing

Companies contemplating the use of metal powder for product manufacturing will be interested in the new DoALL metal powder presses, manufactured by Continental Machines, Inc.



It is the press that assures proper density in the shape to be formed. A 30-60 ton press is unusual in that the pressures are applied from the top and bottom as well as side pressures simultaneously through hydraulic cylinders. Variations in pressure on each cylinder are also obtainable by adjustment valves operating from a conveniently located control panel. Other models are described with their specifications in literature of the DoALL Company, Des Plaines, Illinois.

706

The Bright and Shiny Look With New Copper Dip Solution

A non-toxic, non-fuming platers' bright dip has been introduced under the name of Rossaul Copper-Brite. To be used for the dipping of copper and copper alloys, this new product removes oxides and leaves metal bright and shiny, resistant to future tarnish or discoloration. The metal is left passivated and ready for the next operation.

Used at room temperature in acid resistant still tanks, Copper-Brite requires only

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a dip and clear water rinse. Only five seconds of immersion are required for a bright dip; three minutes for removal of heat scale. It will not discolor silver solder. Rossaul Company, New York 23, N. Y.

707

Easy Elevation With Tote Pan Lift Truck

Open forks engage the side handle or lip of tote pans and lift the entire load by a simple downward push of the operating handle in a new Tote Pan Lift Truck. Easy elevation is made possible by adapting the principle of mechanical leverage using the handle as a lever and the rear wheels as a fulcrum.

The truck, having a capacity of 600 lbs., is designed of tubular and formed steel parts, resulting in a strong, lightweight unit. An automatic lock holds the load in the elevated position and a pedal release controls lowering. Two swivel casters allow the truck to be maneuvered into cramped quarters with ease. Lyon - Raymond Corporation, Greene, N. Y.

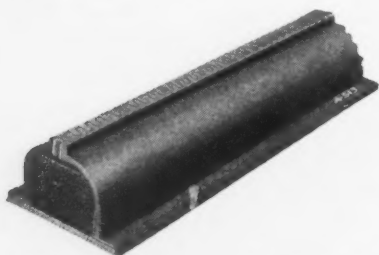
708

Zipper Belt Conveyor Handles Bulk Materials

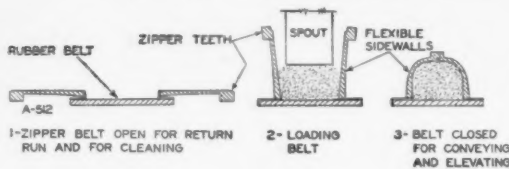
A new method of handling bulk materials is possible with the introduction of the "Zipper" Belt Conveyor-Elevator, manufactured for the Stephens-Adamson Manufacturing Company, Aurora, Illinois, by the B. F. Goodrich Company.

Material can be conveyed and elevated in any direction, in a solid mass, entirely enclosed within the belt. For complete discharge, the belt opens automatically, and it can be opened for thorough cleaning.

Test installations show that the Zipper belt will convey over long distances and to considerable heights without spillage, breakage, or contamination of the product. It is suitable for handling bulk foods, dry chemicals, coal or any granular, flaky, pulverized or small lump materials. This conveyor-elevator has a multi-plan feature which is described with the operation and typical installations in zipper belt conveyor bulletin 344.



• Above, section through Zipper belt showing how granular materials are conveyed and elevated within enclosed walls of casing. Right, diagrams showing section through belt: 1, opened; 2, at loading point; 3, zipped closed.



Laboratory Centrifuge Is Ideal For Tests

A heavy-duty hand power centrifuge has been designed to swing two or four 100 cc. tubes with minimum effort. Its unusual features include ball bearings throughout, and a 24-to-1 gear ratio, permitting reduced crank speed. The outer diameter of swing is 16 inches. A stationary guard bowl reduces air resistance and protects the operator from whirling parts, and the entire unit can be stowed in this bowl when not in use.

It is of particular value for making tests in plants which are processing or using petroleum products, foods, paints, phar-



maceuticals, and in general laboratory research involving precipitation, sedimentation, or extractions. The Gerin Corporation, Red Bank, N. J.

710

Pillow Blocks And Accessories

A new line of Shopcraft power accessories is announced by O. F. DeCastro and Associates, Distributors, Los Angeles 15, California. Included are die cast pillow flanges, collars and Vee belt sheaves, circular blocks, saw and grinding wheel mandrels.

The low cost pillow blocks are larger and heavier and include a split cap securely bolted in position with 5/16-in. cap screws. A spring-top oil cup is fitted to the bearing cup, providing an oil reservoir for bearing lubrication. The blocks are uniform in size with bearing inserts available in bore diameters of 1/2 in., 5/8 in., 3/4 in. and 1 in.

Steel mandrel assemblies are available in two types: threaded at each end and threaded at one end only; they come in 1/2 in., 5/8 in., 3/4 in., and 7/8 in. diameters.



Shopcraft accessories are suitable for all jackshaft applications and are sold as units or as complete assemblies.

711

Impact Nut Setter Is Faster, Easier

A new high-speed electric impact nut setter, introduced at a recent machine tool show, has the labor-saving features of speed and maximum ease of operation; it is torqueless and will not twist in the operator's hand when nut becomes tightened. It operates at high speed, driving nut or bolt 1,750 r.p.m. at free speed. At point



of resistance, the impact unit automatically delivers 3,000 impact blows per minute.

The heart of the tool is the impact unit which is made of Silman steel forgings for maximum endurance and equipped with precision ball and roller bearings. It can be removed in 45 seconds or less if service is required. Illinois Gage & Manufacturing Corporation, Chicago 44, Illinois.

712

A New Series Of Precision Barometers

Designed and engineered for persons who desire an accurate, sensitive instrument, the new precision barometers manufactured by the American Paulin System, Los Angeles, California, offer an advan-

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tage over the mercury column in readability and in simplicity of operation.

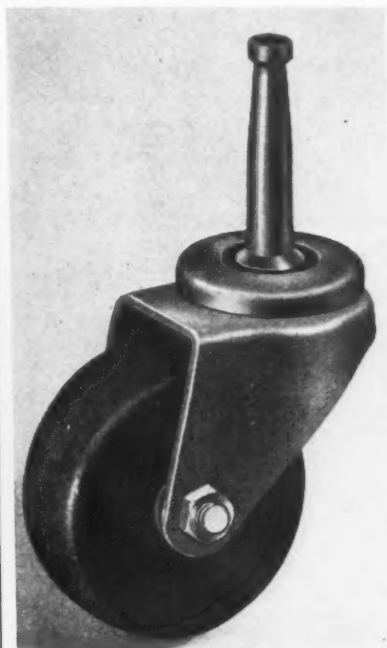
The outstanding instrument in this new series is the PB500—an aneroid instrument that is graduated in intervals of 1/500 in. of mercury. It is super-sensitive and super-accurate, and has been designed for scientific and laboratory use.

All friction-creating mechanisms are eliminated in this exclusive system of instrumentation. The slightest change in atmospheric pressure is instantly indicated on the dial and read directly in inches of mercury.

713

Smooth Action Ball Bearing Casters

A two-inch, ball bearing office chair and furniture type caster is being manufactured by the John Cavanaugh Company, Los Angeles. Raceways are made of case-hardened steel. Stem models are finished in oxidized bronze; plate models are cadmium plated. Wheels come equipped with non-marking composition rock-hard rubber, or with cushion tread. The plate caster is also available with steel wheels for hard floors.



Silicone News



Men versus Inertia

Your best men fight inertia. They are never satisfied with things as they are. They know that there's always a better way, and that someone else will find it if they don't. They know, as you do, that major improvements in design and performance result from the use of new and different materials.

That's why they are so eager to find out about Dow Corning Silicone Products. These new and basically different materials make the "impossible" practical. Here's a good example.



COURTESY HOUDRE ENGINEERING DIVISION, HOUDAILLE HERSHEY CORPORATION
 High viscosity DC Silicone Fluid makes possible this simple, durable torsional vibration damper for automobile and diesel crankshafts. Inner flywheel, separated by a film of DC Silicone Fluid from housing attached to end of crankshaft, tends to rotate at constant speed. Any change in speed is damped by shear resistance of silicone film.

Operation of this device depends upon the well-established principle of viscous damping. That principle has been of limited use, however, because there were no fluids that did not thin out at high temperatures, thicken at low temperatures, or break down under mechanical shearing.

But our silicone fluids do not behave the way other fluids do. They have a singularly constant viscosity at both high and low temperatures, and they don't break down under constant shearing. Farsighted engineers seized upon these unique properties to make viscous damping a practical reality.

Unique properties such as these distinguish all Dow Corning Silicone Products—resins, varnishes, fluids, lubricants, and Silastic.* You, or someone in your plant, will want to know more about the DC Silicones.

Our engineers have had over four years of experience in producing them on a commercial scale and in adapting them to many lines of business. Telephone one of our offices or write for Catalog No. XI-1.

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MECHANICAL KINKS

By W. F. SCHAPHORST, M.E.
Former Engineering Instructor
New Mexico State College

Electric Versus Acetylene Welding

A contractor who has been in the business a great many years and who has had an unusual amount of experience with welding states that he uses both electric and acetylene welding, depending on the labor cost in every particular instance. The cost of labor, he says, is the thing to watch. He states that both electric and acetylene methods are entirely dependable and will do good jobs, but he finds that on the smaller pipe sizes, up to and including 2-inch diameters, acetylene welding is less costly from the labor standpoint. On pipe diameters larger than 2 inches he employs electric welding.

Leather Packing Advice

Have you ever cursed a manufacturer of leather packings for "doing a bum job" of hole punching? Are you sure, now, that the fault wasn't your own? It very likely was your own fault.

It often is best not to ask a manufacturer to punch holes through leather packing. It is not good practice. This is especially true if it is intended to keep the packing in storage for a while because even the best leather shrinks or changes shape so that after a while the holes will not match. When the user finds that the holes do not match the bolts he of course is inclined to blame the manufacturer, whereas the manufacturer may not be to blame at all. Therefore, unless the packing is to be used immediately it is better for the user to cut the bolt holes himself.

Furthermore, when giving the manufacturer instructions regarding punching bolt holes be certain that the instructions are complete and accurate. Too often, instructions are meagre and vague and cannot be followed by the manufacturer with assurance. He finds it necessary to ask questions or to call for a template.

What Belting Weight Is Best?

Every once in a while somebody wants to know the weight of belting. Unfortunately there are very few handbooks and catalogs that give the weights of the various types of belts used in industry. The writer finds the following weights in one of his books — for three types of belting:

Oak tanned.....	0.035 lb. per cu. in.
Cotton & Canvas.....	0.026 to 0.05 lb. per cu. in.
Rubber.....	0.045 lb. per cu. in.

In computations that the writer has made he finds that hair belting weighs ap-

proximately 0.035 lb. per cu. in., and high grade mineral tanned leather belting weighs about 0.030 lb. per cu. in.

In this connection, users of belting will doubtless be interested in the following table which the writer has copied from Bulletin No. 41 of the Ohio Engineering Experiment Station entitled, "Transmissive Power and Stretch of Belting," by Prof. C. A. Norman and Prof. G. N. Moffat:

Kind of Belt	linear ft., pounds
Rubber No. 1.....	0.266
Balata.....	0.268
Stitched Canvas.....	0.36
Oak Tanned Leather.....	0.209
Mineral Tanned Leather.....	0.162
Hair.....	0.314
Solid Cotton.....	0.199
V-belt, rubberized.....	0.196

The figures in this last table, above, relate to single ply leather belts 3 in. wide, or equivalent. The V-belt though, of course, is rather difficult to compare.

The most interesting thing to the writer in the above table is that the mineral tanned belt, which is the lightest of them all, outpulled them all. Stitched canvas belting, which is the heaviest, gave the poorest results. Mineral tanned leather belting pulled 70 per cent more than oak tanned, and 60 per cent more than rubberized V-belt.

How to Utilize Worn-out Substitute Belting

It is well known that worn-out leather belting can be used for soles of shoes, for straps, for cutting into narrower belts, etc. But is not so well known that substitute belting, also, possesses considerable salvage value. Every once in a while the writer learns of instances where worn-out substitute belting is used to profitable advantage.

For instance an old rubber belt was recently used for packing a pump plunger. The belt was cut into uniform strips of a thickness to fit nicely into the stuffing box. The lengths were such that each strip would wind around the piston rod once. It wasn't a small job either. The rod was seven inches in diameter, hence each piece was made slightly over 22 inches long.

The writer has also seen wide belting, made of solid woven cotton, cut up into short lengths and doing duty as mats on floors. Such mats are excellent for deaden-

ing sound, and they make good insulators to keep heat in or out, serving the same purpose as a carpet. Several lengths piled one on top of the other make good pads or shock absorbers upon which delicate heavy objects may be dropped without danger of bruising and with protection to the floor. Old hair and rubber belts may be used in the same way. A substitute belt that is so badly worn that it must be thrown away and that cannot be used for some purpose other than power transmission would be very badly worn indeed.

How Strong Is a Rope?

This writer finds that most users of rope and steel cable don't know the relationship between the size of the rope and its strength. They know that a large rope is stronger than a small rope, and that's about all. It is therefore believed that the following rules will be welcomed:

For cotton or hemp rope square the diameter of the rope in inches and multiply the product by 200. Thus for a 1/2-in. rope we have 1/2x1/2x200 or 50 pounds, which is the safe strength.

For steel cable square the diameter of the cable in inches and multiply by 12,000. Thus for a 1/2-in. cable we have 1/2x1/2x12,000 or 3,000 pounds, which is the safe strength. Do not apply this latter rule to iron rope. Iron rope is not as strong as steel rope.

Double Life For Conveyor Belt

Many of the readers of this publication are perhaps familiar with the method of lengthening the life of a conveyor belt by turning it through 180 degrees, or, "end for end" as some people express it. The wear is equalized in that way, hence the life of the belt can be considerably prolonged.

That gave one user an idea, as follows: This man operated a long conveyor belt and the wear was severe due to the nature of the material handled. Conditions in the plant were such that the belt had to be considerably wider for handling peak loads than was necessary for normal conditions. In fact the peak—occurring less than 10 per cent of the operation time—was more than twice the load handled during normal operation.

So, with the above facts in mind, the operator, who was somewhat of a designer himself, arranged the installation in such a way that the lighter load was carried off center, and the point of impingement of the load while falling on the belt was distributed over one side from center to edge. As a result most of the wear takes place on one side of the belt, and, because of this fact, he can reverse the belt and really get more than double the wear as compared with carrying both loads in the middle of the belt and permitting the impingement to occur directly in the center at all times.

HELPFUL LITERATURE

For the plant operator
who wants to keep informed

2293

Micromax Model R Indicating Recorders—

For the first time, a compact publication listing under one cover all round-chart Micromax instruments is yours for the asking. Called "Micromax Model R—Indicating Recorders and Controllers," this publication is not limited to those instruments used to measure any one quantity or using any one primary element—but, for the first time, it presents all Micromax Model R's, regardless of whether they are supplied to measure temperature, through the use of thermocouples, Rayotubes, or Thermohms, or others. Included are complete specification in tabular form for automatic indicating recorders, and indicating and recording controllers. Suggested chart numbers are also listed for the more commonly used ranges, together with other accessories and supplies. Catalog ND44(2), Leeds & Northrup Co., Philadelphia 44, Penna.

2294

Safety & Relief Valves—A new six-page illustrated Condensed Specifications Bulletin (No. 50) has just been announced. This new booklet facilitates the prompt selection of relief or safety valves by means of a carefully laid out detailed index which comprises two full pages. This listing gives all type numbers and other pertinent data, together with comparison numbers of other commonly used valves. Sizes, pressures and materials are all clearly indicated to assist the user in a ready choice of the proper equipment. Another two pages are devoted to a display of 31 separate valve sectional line illustrations, which give the user a clear picture of the various types of valves indicated in the index. A separate page is devoted to the story of nozzle valve features which are an integral part of Farris valve design. Farris Engineering Corp., Palisades Park, New Jersey.

2295

Double Hydraulic Cylinders—Copies of the 52-page illustrated brochure on double acting hydraulic cylinders are offered without charge to individuals engaged in work involving the use of this type of equipment. Planned primarily to provide a complete source of information and data for design engineers, the manual also contains material of value to engineers in charge of installation, operation, and maintenance of hydraulic power equipment. An interesting feature of the bulletin is the presentation of 11 standardized mounting styles which can be used in a variety of combinations to solve almost any conceivable power application problem without involving special designing and construction. As an overall guide to proper selection of hydraulic cylinders, a check list is also included covering the points that should be considered in specifying cylinders and designing installations. Hannifin Corporation, Chicago.

2296

Interior Lighting Booklet—To help architects, electrical contractors and lighting engineers achieve both comfortable seeing conditions and modern lighting effects, a booklet describing the new recessed troffer luminaires has been prepared by Westinghouse. Pointing out the ease of installing and maintaining proper illumination by use of the versatile troffer, this 12-page booklet includes photographs, sketches, schematic diagrams, illumination design data and suggested layouts for various conditions.

Copies of the booklet (B-3959) may be obtained from the Westinghouse Electric Corporation, Pittsburgh 30, Pennsylvania.

2297

Practical Aspects of Grinding—A well-illustrated 73-page brochure, "Injury in Ground Surfaces," is designed to help the worker detect and recognize the various forms of injury; to decide whether the injury is serious enough to affect the useful life of the part; and to track down and eliminate the principal causes of surface injury so that the parts are produced uninjured in the most economical fashion. Dr. L. P. Tarasov of the Norton Research Laboratories is the author. Norton Co., Worcester 6, Mass.

2298

Gravity and Power Conveyors—Nine types of standardized units are described in this booklet, including several conveyors that have been designed within the past four months. Equipment is illustrated with photographs, drawings, and detailed specifications pertaining to the conveying of a widely diversified line of commodities. Standard Conveyor Company, North St. Paul 9, Minn.

2299

Green-Vegetable Packing Equipment—Ice crushers and pulverizers; ice crusher-slingers for "top-icing" long-haul shipments of green vegetables; conveyors for vegetables, culls, crates, block ice, crushed ice; and a complete line of power transmission machinery, are featured in this eight-page book No. 2073. Link-Belt Company, Chicago 1, Ill.

2300

Truck Operators' Handbook—This 33-page book is designed to provide a printed means by which truck operators can reduce operating costs and thus increase profits by proper selection and maintenance of tires. Controlling of air pressure, analyzing of loads, speeds and their effects, periodic inspection, and 93 factors which affect truck tire life are features, including data on each type of truck tire the company manufactures. The B. F. Goodrich Co., Akron, Ohio.

2301

Micro-Accuracy With Double Spindle Disc Grinders—This bulletin describes the double spindle disc grinding method of finishing opposite faces or work pieces, flat and parallel simultaneously. Six grinders are illustrated with brief specifications, and useful accessories are mentioned. This is bulletin No. 647-1. Hanchett Manufacturing Company, Big Rapids, Mich.

2302

"Weatherproofing" Exposed Metal—A new product, "Dum Dum for Metal," has been developed which provides a tough but elastic and pliable weather-resistant, water-repellent coating for use on new or uncoated metal structures. It "seals out" measurable moisture, vapor, and chemical gases and fumes. In the illustrated bulletin, "Lasting Protection for Metal Surfaces," seven typical applications are described, along with directions for using the material and preliminary surface preparation required. The Arco Company, Cleveland, Ohio, and Los Angeles, California.

2303

Gas Cyaniding and Carburizing—The illustrated catalog, "Homocarb Method for Carburizing and Gas Cyaniding," describes how nu-

merous Homocarb furnaces are now being used for gas cyaniding and provides information about the latest improved equipment for carburizing steel. Information is also included on the improved Homocarb control panel complete with Micromax Electric Control, time clock, accessories and its related contactor cabinet. A diagrammatic view of the Homocarb, with built-in natural-convection cooler, shows how the load is protected not only during heating and soaking, but during cooling as well. This material is available in Catalog T-623. Leeds & Northrup Company, Philadelphia 44, Penn.

2304

Resistance to Corrosion—SuVeneer clad strip steels are the subject of a new four-page bulletin, "SuVeneer Clad Metals." SuVeneer clad metal is low carbon strip steel clad inseparably on one or both sides with solid copper, monel, or nickel. The strength and economy of steel is thus combined with the special advantages of the particular cladding specified. Superior Steel Corporation, Carnegie, Pennsylvania.

2305

Source Book on Plastics—The publication of the 451-page Handbook of The Society of the Plastics Industry makes available a final source of standard information on plastics and the best practices of the plastics industry. Three hundred technicians and other authorities from over 600 firms worked on the book. Six chapters were released as preliminary booklets in the last three years but these have been revised for the final publication. There are approximately 500 charts and illustrations in the book. The Chairman of the Handbook Committees is N. J. Rakas of National Automotive Fibres, Detroit. The book is being distributed free to all members of the Society and will be available to non-members at \$7.50. Society of the Plastics Industry, New York 17, N. Y. . . . What plastics really are, what they will and will not do, how to buy them, how to take care of them, is the story told dramatically and colorfully in the October issue of HOUSE BEAUTIFUL Magazine. This information is available in a reprint and serves as an index of the great potential possibilities and the millions of useful applications of plastics in the home. House Beautiful Magazine, New York 22, N. Y.

2306

Directory of Information Sources—The Bay Area Council announces the publication of a "Directory of Information Sources for Industry, Commerce and Trade in the San Francisco Bay Area." It is a 52-page booklet with an insert map of the principal Bay counties, to be used as a guide-book for industrialists, businessmen, public and private organizations and others interested in securing specific data and authoritative answers to their inquiries concerning the entire Bay area. This directory is the first to be developed to serve all communities of the nine Bay counties in terms of civic and economic development. San Francisco Bay Area Council, Inc., San Francisco 4, California.

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Francisco, Calif.

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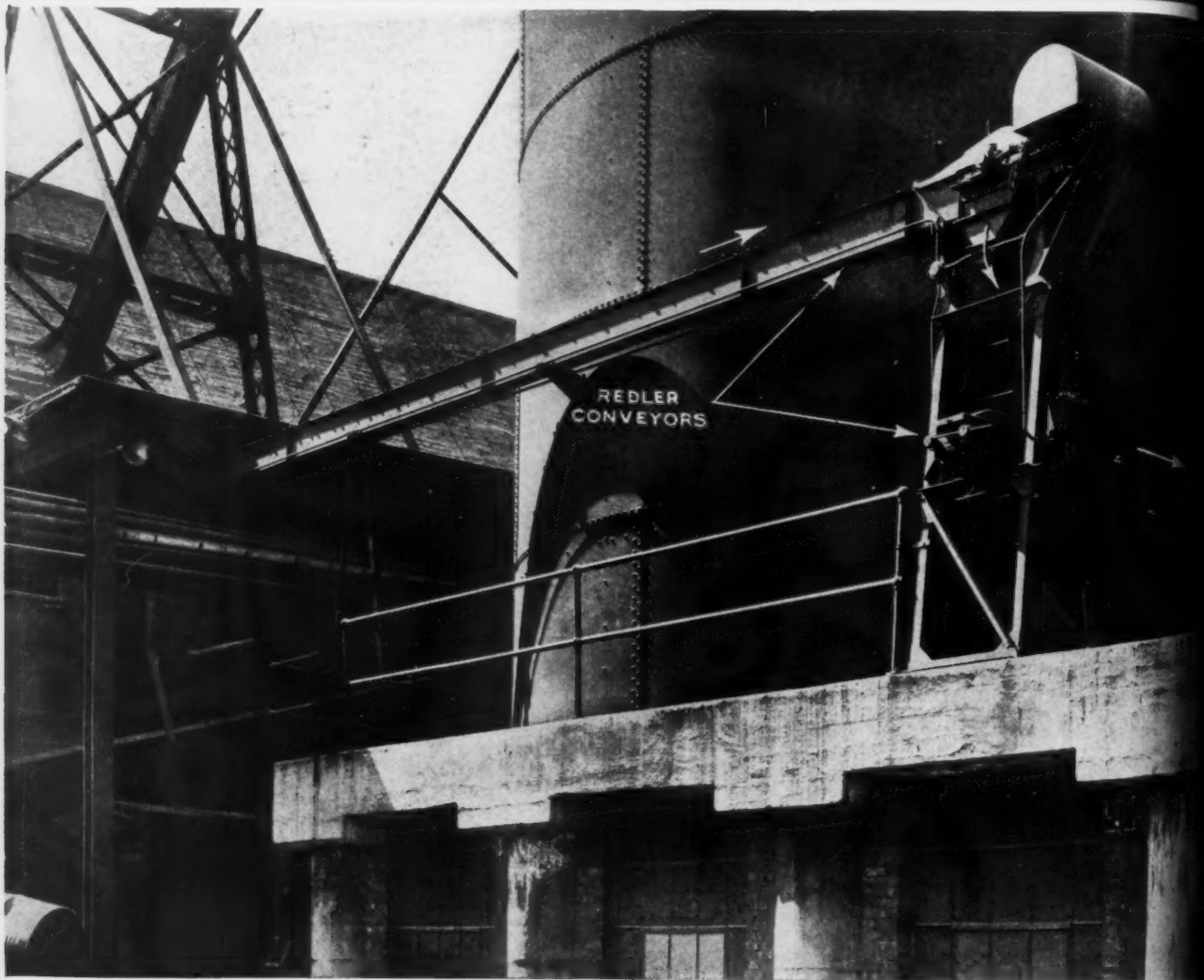
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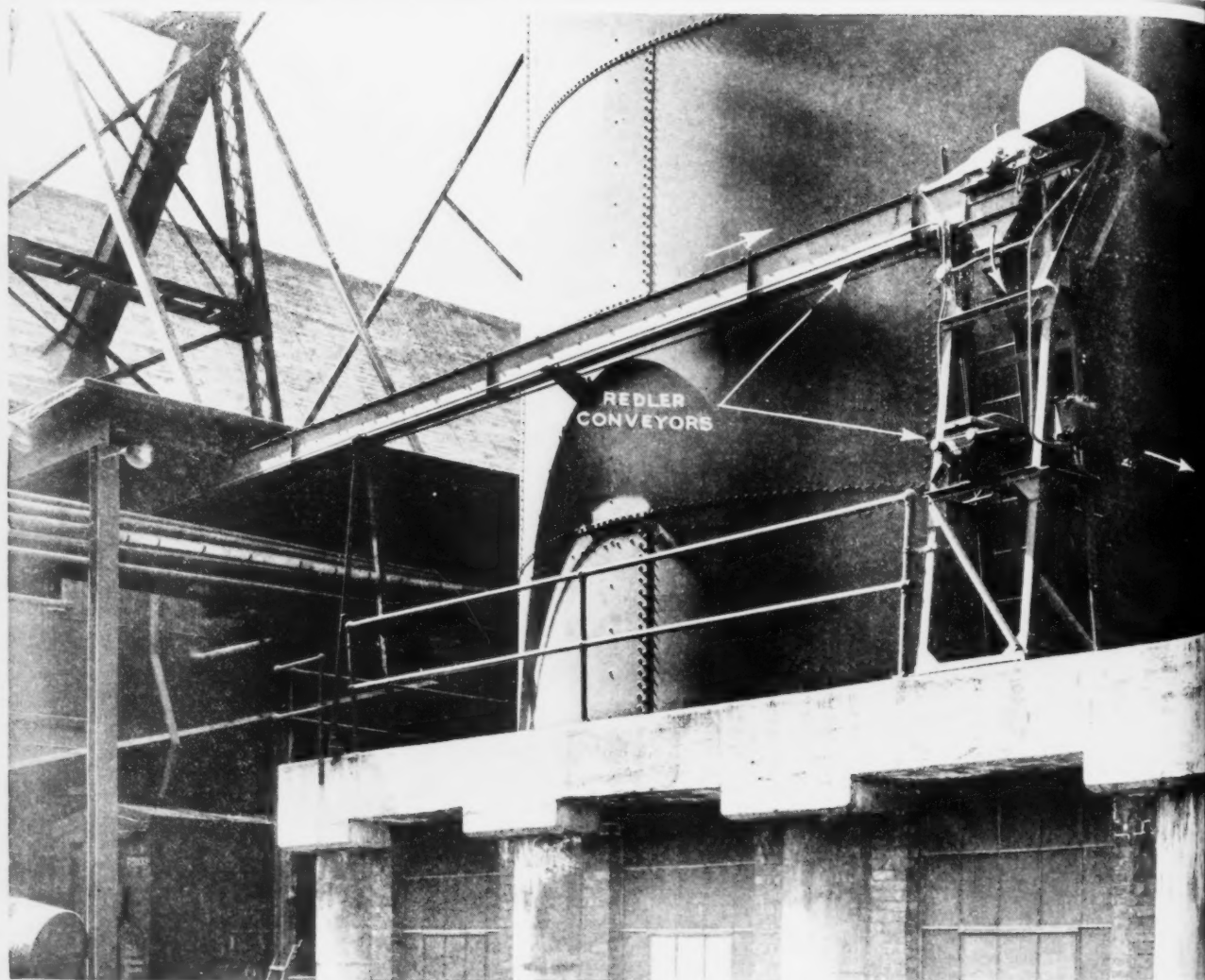
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